

Rochester Institute of Technology

RIT Scholar Works

Theses

5-2016

[CODE PREMONITION][™]: A 2D animation experience featuring DUIK technology

Jason E. Harris

Follow this and additional works at: <https://scholarworks.rit.edu/theses>

Recommended Citation

Harris, Jason E., "[CODE PREMONITION][™]: A 2D animation experience featuring DUIK technology" (2016). Thesis. Rochester Institute of Technology. Accessed from

This Thesis is brought to you for free and open access by RIT Scholar Works. It has been accepted for inclusion in Theses by an authorized administrator of RIT Scholar Works. For more information, please contact ritscholarworks@rit.edu.

A JASON HARRIS VISION

[CODE PREMONITION]TM

A 2D ANIMATION EXPERIENCE FEATURING DUIK TECHNOLOGY



JASON E. HARRIS

Master of Fine Arts

Visual Communication Design



SCHOOL OF DESIGN

College of Imaging Arts and Sciences

Rochester Institute of Technology

May 2016

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF FINE ARTS IN VISUAL COMMUNICATION DESIGN



THESIS COMMITTEE ADVISORS



PROFESSOR CHRIS JACKSON

Chief Advisor

Visual Communication Design



PROFESSOR MARLA SCHWEPPE

Associate Advisor

Visual Communication Design



ASSOCIATE PROFESSOR SHAUN FOSTER

Associate Advisor

Visual Communication Design



THE TABLE OF CONTENTS

03 ACKNOWLEDGEMENTS

04 ABSTRACT

05 INTRODUCTION

11 PROCESS

INTRODUCTION - PG. 11

STORY SYNOPSIS - PG. 11

PRE-PRODUCTION PG. 12

PRODUCTION PG. 23

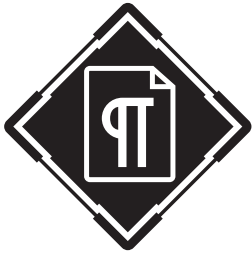
POST-PRODUCTION PG. 31

35 SUMMARY

40 CONCLUSION

41 BIBLIOGRAPHY

43 APPENDIX



SHOUT-OUTS [ACKNOWLEDGMENTS]



FIRST & FOREMOST

I would like to dedicate this project to everyone who has shown their unconditional love and support for my artistic endeavors since day one. To every teacher, relative, mentor, and friend who has participated in molding me into the person I am today, I thank you and I thank God for your blessed presence in my life!



DECODED [ABSTRACT]



WHAT IS CODE PREMONITION?

Code Premonition is a science fiction/suspense short film that is designed with the intent to provide its target audience, adults over the age of 25, with a solid exhibition of imaginative storytelling based on the realization of the following two primary objectives:

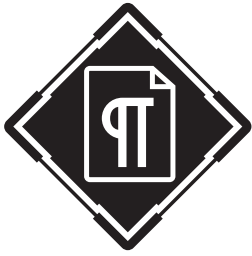
1.) Provide the audience with a visually captivating and suspenseful cinematic experience via the effective utilization of voice acting, realistic artwork, fluid animation, real world footage, and special effects.

2.) Provide the audience with a consistent and compelling original story; the treatment of which will provide a well balanced exhibition of both traditional and non-traditional film making techniques that creates the opportunity for an even more impactful delivery of the first objective.

Along with the intent to seek out the fulfillment of these two key objectives, the overall goal of this thesis is to encourage and support the production of future independent science-fiction themed intellectual properties¹ under the Code Premonition brand name.

Keywords: Cinema, Science Fiction, Suspense, 2D, Animation, Inverse Kinematics, DuK Technology

¹“What Is Intellectual Property,” *WIPO (World Intellectual Property Organization)*, accessed June 2, 2016, <http://www.wipo.int/about-ip/en/>.



IGNITION [INTRODUCTION]

"SCIENCE FICTION IS TRYING TO FIND ALTERNATIVE WAYS OF LOOKING AT REALITIES."

- IAIN BANKS



FREE YOUR MIND

What comprises the definitive science fiction experience? Some people adhere to the more traditional belief that the defining science fiction experience involves the depiction of wild and exciting adventures involving the utilization of advanced futuristic technology and weaponry. These adventures are often set light years into the future on yet to be discovered planets that of course provide adequate housing for all kinds of extraterrestrial threats (*Riddick*)². Some people believe that science fiction involves the depiction of drug-induced, mind bending experiences that challenge the conventions of logic and physics (*Inception*)³. And finally, some people believe that science fiction involves the interpretation of an event or a series of events that have transpired, have yet to transpire, or are feared to inevitably transpire (*The Terminator*)⁴.

Considering this input, there is clearly a lot of grey area to deal with when it comes to providing science fiction with a single, categorical image. However, at the heart of all three of these characterizations lies a common denominator. Science fiction, as the name implies, is an art form that simply tries to find alternative ways of depicting reality.

² *Riddick*, Blu-Ray/DVD, directed by David Twohy (2013; Universal City, CA: Universal Studios Home Entertainment, 2014).

³ *Inception*, Blu-Ray/DVD, directed by Christopher Nolan (2010; Burbank, CA: Warner Home Video, 2010).

⁴ *The Terminator*, Blu-Ray/DVD, directed by James Cameron (1984; Culver City, CA: Sony Pictures Home Entertainment, 2006).



IGNITION

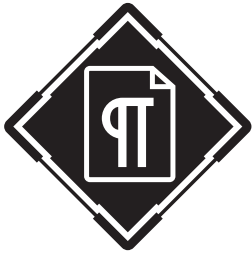
[INTRODUCTION - CONT'D]

Whether it involves a perilous journey to the far reaches of space, a day inside of the deepest recesses of the mind of a serial killer, or the depiction of a world without sound, all three of these scenarios illustrate a well crafted deviation from the monotony of daily living. From a cinematic standpoint, some of the most memorable, classic science fiction experiences ever captured on film have managed to rearrange reality in ways which were never thought to be possible before.

A defining example of this is *The Matrix*⁵, is an exemplary representation of science fiction craftsmanship and an all-time classic in the great pantheon of science fiction films. The Matrix' formula for redirecting reality is two equal parts historical reinterpretation and mind bending action. At its core, *The Matrix* is a clever interpretation of an event that was once widely feared to inevitably occur but so far has not. The Matrix is set in a world that alternates between a more reality based version of the year 1999 and a more tumultuous post-apocalyptic interpretation of the year 2199. Within this setting, fear of the decimation of Isaac Asimov's famed Three Laws of Robotics⁶ has come to fruition and all of humanity's dominion over planet earth has been completely overthrown by the rule of machines. One man, Thomas A. Anderson, a quiet mild mannered computer hacker that goes by the alias Neo, is convinced by a man named Morpheus, the leader of a group of cyber rebels, that the world in which Neo lives in (where he believes it is the year 1999) is nothing more than a digital illusion created by the machines called *The Matrix*; which is used by the machines as a means to maintain their control over the minds of humanity.

⁵ *The Matrix*, Blu-Ray/DVD, directed by Lana and Lilly Wachowski (formerly The Wachowski Brothers) (1999; Burbank, CA: Warner Home Video, 2007).

⁶ Ulricke Barthelmess and Ulrich Furbach, "Do We Need Asimov's Laws?" (Thesis Document, Cornell University Library, 2014).



IGNITION

[INTRODUCTION - CONT'D]

Morpheus ultimately convinces Neo that Neo is the only one that possesses the power to put an end to the machines' reign of terror and free all of humanity from its mental and physical imprisonment.

To say that the plot of *The Matrix* relies quite heavily upon pre-calculation is an understatement. The film was originally released in the year 1999, the same year in which its plot is set in. Loyal partisans of *The Matrix* over the age of 25 may be able to recall the once infamous Y2K Scare⁷, an actual real world cyber threat which caused widespread panic during the same year; that is until its menacing presence was finally eradicated once the clock struck 12am on January 1st of the year 2000. So in a very ingenious fashion, *The Matrix* was able to capitalize rather well off of humanity's actual worst fears and combine them with various fantastical elements in order to provide a far more unstable depiction of an already teetering reality.

What is even more impressive about the design theory behind *The Matrix* is the film's ability to deliver uniformity between imagination and reality on multiple levels. The film chooses to not only represent this balance from a narrative standpoint; it also makes this balance readily apparent from a visual standpoint as well. Aside from not straying too far from its true-to-life representation of the year 1999, the film also chooses not to delve too deeply into the mythos of a far-fetched interpretation of the future.

⁷ Frances Romero, "End Times: Top 10 End-of-the-World Prophecies (Y2K)," *Time Magazine*, May 20, 2011, accessed June 7, 2016, http://content.time.com/time/specials/packages/article/0,28804,2072678_2072683_2072599,00.html.



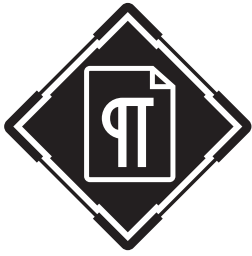
IGNITION

[INTRODUCTION - CONT'D]

Similarly to *The Matrix*, *Code Premonition* also utilizes a main narrative premise that plays quite heavily upon fear. More specifically, as the title of the film suggests, *Code Premonition* plays on the type of fear that is associated with a lingering sense of anxiety over an uncertain yet impending catastrophe. On the other hand, the lingering sense of anxiety in *The Matrix* stems from the fear of failure. Considering this point, there are two different methodologies at play which are used to handle these two forms of fear cinematically. This is where the similarities between *The Matrix* and *Code Premonition* start to differ a bit. The way in which these two differences are addressed however reunites under the umbrella of realism; and logically so.

Case and point, realism helps in contributing a greater sense of practicality to even the most impractical situations. When it comes to causing disconcertion or exhibiting the logically impossible, the brain needs to constantly be persuaded that whatever visual information it is receiving has some degree of logical consistency; otherwise there will eventually come a point in time where the brain chooses to no longer accept the validity of this information. That is the point when a movie becomes a bad movie. Both *The Matrix* and *Code Premonition* utilize realism in different ways in order to cinematically facilitate the existence of fear. To start, *The Matrix* is an action film, which leaves plenty of opportunities to create pockets of suspense throughout its duration. In order to reinforce the believability of its fiction, *The Matrix* relies quite heavily upon its utilization of live-action. It uses these real world elements (i.e. – human actors, common architecture, retrofitted technology⁹, common clothing, death, etc.) in proper conjunction with computer generated imagery (i.e. - *The Machines*, the mutable physical appearance of *The Matrix*, etc.) in order to unify its science (reality) and its fiction (imagination).

⁹ (Technology) Adding a component or accessory to something that did not have it when it was originally manufactured.



IGNITION

[INTRODUCTION - CONT'D]

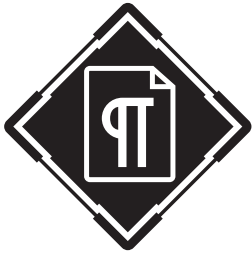
Despite the fact that characters in *The Matrix* can dodge bullets and leap tall buildings in a single bound, one misstep could kill them instantly; because they are still human. Cinematically, this creates a very exciting prospect. The fear of failure or the fear of making a fatal mistake remains constant throughout the film. In contrast, *Code Premonition* is a short, animated suspense film that, similarly to *The Matrix*, utilizes science to promote its fiction. As opposed to *The Matrix*, which is a feature-length film, *Code Premonition* has a shorter amount of time to visually relay its narrative premise and make it effective. This means that the flow of disconcerting energy has to remain somewhat constant and for a shorter amount of time all the way up until the film's conclusion. Cinematically, *Code Premonition* utilizes a reverse juxtaposition of computer generated imagery (i.e. – realistic 2-dimensional characters and environments) in conjunction with live action elements (i.e. – raw camera footage, voice acting, live action special effects, etc.) in order to create a realistic scenario. Despite the fact that *Code Premonition* is ultimately a cartoon, the characters off screen, the human voice actors, are tasked with convincing the audience that what they are seeing on-screen in the animation is actually life threatening. These animated actions will most likely get the characters off screen either killed, seriously injured, or perhaps much worse—stranded in outer space should they survive the ordeal. This scenario also presents quite the exciting prospect cinematically. The feeling of knowing for certain that something will go wrong yet not knowing exactly when or how the trouble will begin or end is an unbearable thought for some. However, this formula of juxtaposing the real and the artificial together in this fashion may look appropriate on paper, but it also begs the question of whether or not this formula truly works in motion. How well managed is this juxtaposition throughout the duration of the film? Will this experience leave the audience craving more? Is the conflict in the film believable? This is for the audience to decide.



IGNITION

[INTRODUCTION - CONT'D]

When it comes to having high hopes and aspirations for Code Premonition, the standard by which uber classic films such as The Matrix establish themselves is not the easiest to try and live up to; especially if one is venturing into the world of film making for the very first time. However, since the goal for Code Premonition is for it to be the start of great things to follow, the attempt to live up to such a high standard from the very start is a not a bad idea. Code Premonition's overall goal is to deliver a short and intense science fiction experience that is reminiscent of an 80's classic with a modern polish. This experience is designed to whet the appetite and, at the very least, provide the initial spark that will lead to the creation of even greater science fiction projects of the same brand name in the future.



LO-FI SCI-FI [PROCESS]



A JOURNEY RECOUNTED

Multiple layers of uniformity between imagination and reality are conceptually what Code Premonition aims to establish. Like *The Matrix*, Code Premonition exists within its very own alternate version of reality. Once the reality of Code Premonition was firmly established (i.e. – the setting, the flow of events, the characters, the psychology, etc.) the opportunity to alter that reality presented itself quite freely.



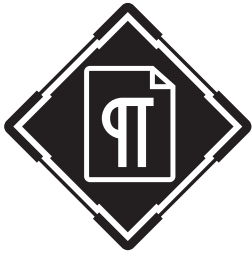
A JOURNEY RECOUNTED: CODE PREMONITION STORY SYNOPSIS

Set in the year 1979, Code Premonition takes the audience on a mysterious adventure to the Jovian moon Io (Fig. 1)¹⁰, the most volcanically active celestial body in the solar system. At its core, the film presents a dark play on humanity's perpetual desire to harness control over things that it has no rightful dominion over and the consequences that are to be paid for doing so. For this part, a central element to the story, codenamed Sentium (Fig. 2)¹¹, is introduced. Sentium is a fictional, electromagnetically potent igneous rock compound that is a by-product of the actual volcanic emissions that frequently take place on Io. The human characters in Code Premonition, who are a combined team of excavators and researchers tasked with retrieving samples of Sentium from Io, believe in theory that the process of reverse engineering¹² the power of Sentium will potentially lead to the establishment of another substantial renewable energy source on Earth.

¹⁰ Bill Dunford and Katie McKissick, "Planets – Io: In Depth," *NASA Online*, accessed September 5, 2015, <http://solarsystem.nasa.gov/planets/io/indepth>.

¹¹ Loosely based on the terms **Sentient** and **Sentience**, synonyms include the terms *aware*, *alive*, and *conscious*.

¹² The reproduction of a product following a detailed examination of its construction or composition.



LO-FI SCI-FI [PROCESS - CONT'D]

However, before they can properly test this theory, they must first debunk yet another theory. A second theory suggests that the existence of Sentium on Earth poses a potentially massive radioactive threat to the planet. In order to minimize their potential losses as much as possible, the research team decides to conduct an animal based experiment that will fully expose a queen hornet, the second central element of the story, to the deadly power of Sentium.

Code Premonition places the audience in a most uncomfortable state of mind that makes them fully aware that trouble is nigh the entire they are watching. The only question left to ponder is when will the trouble come and how bad will it be? For the audience, this is where the heart of their ride is. For the creator, this is where the heart of the design challenge is.

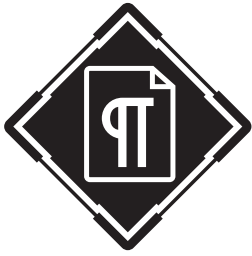
The following sub sections reveal in detail the process of constructing Code Premonition from start to finish. They also contain some of the challenges that were encountered during this process as well as their resolutions.



A JOURNEY RECOUNTED: PRE-PRODUCTION

At the time during which the thesis proposal for Code Premonition was accepted, the project contained just about everything that it needed in terms of a technical direction. The project was to be an animated short film that would be approximately 5 -7 minutes in length. It was also established that Duik, a crowd-funded animation utility program (also often referred to as a plug-in) created for Adobe AfterEffects by French animator Nicolas Dufresne, was going to be a central tool that was used in order to animate Code Premonition's 2-dimensional characters using inverse kinematics (Fig. 3).¹³

¹³ <http://duduf.net/index.php/products/after-effects/duik/>



LO-FI SCI-FI [PROCESS - CONT'D]

Code Premonition's main character, Angel (Fig. 4), an anatomically precise queen hornet, was fully designed and rigged for animation inside of After Effects at this time. Due to Angel's realistic character design, Duik was the most appropriate tool to use for animation because it utilized AfterEffects' fluid motion animation system. Also, since Angel was the first fully fleshed out character design for Code Premonition, her realistic design required that any secondary characters and environmental backdrops follow the same design style. The most important detail to note about this time period was the fact that the project did not have a story. This would later become a major design issue (if not the most challenging design issue overall) to try and manage.

Deciding on the name Code Premonition as the title of the project really helped to set everything that was to follow in motion; including the process of selecting a suitable genre for the project. However, to be frank, when the name Code Premonition was initially selected for the project, there wasn't very much of a reason behind selecting the name. In other words, the name simply had a nice ring to it. However, after spending quite a bit of time consuming science fiction, horror, and suspense themed films and game software, the choice for a genre came rather quickly.

As was previously expressed, Code Premonition is an initial film project. Many of the challenges that were encountered while producing the project were challenges that were experienced for the very first time. Writing the story and treatment for the project involved a process that actually lasted a couple of years. During this time, several different versions of the story and treatment were written and experimented with until at the very end there was finally an arrival at a desired result.



LO-FI SCI-FI [PROCESS IMAGES - 00]

IO & SENTIUM [VISUAL ASSETS]



► **FIGURE 1**
[RENDER OF IO]

A render of the Jovian Moon “Io”, featured in Code Premonition. Io is Jupiter’s fifth moon and the most volcanically active celestial body in the solar system.



► **FIGURE 2**
[RENDER OF “SENTIUM”]

A render of the fictitious rock compound codenamed “Sentiium”, featured in Code Premonition. Sentiium is an igenous rock compound that is the by-product of frequent volcanic emissions which occur on Io. It is highly sought after due to its natural electromagnetic potency.



LO-FI SCI-FI [PROCESS IMAGES - 01]

DUIK & ANGEL [TOOL / VISUAL ASSET]



► **FIGURE 3**
[DUIK USER INTERFACE]

A screen capture of Duik inside of Adobe AfterEffects. Duik is a 2D character rigging and animation plug-in developed by French animator Nicolas Dufresne.



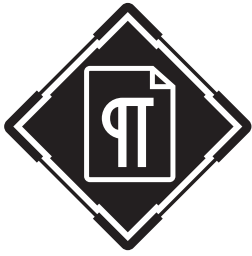
► **FIGURE 4**
[RENDER OF "ANGEL"]

A render of "Angel", the main protagonist/antagonist in Code Premonition. Angel is the most detailed character in Code Premonition both in terms of visual detail and animation.



LO-FI SCI-FI [PROCESS - CONT'D]

The previous versions of Code Premonition all felt quite empty and aimless to both the creator and audience member alike. Upon reflection, this was mainly due to the fact that there was no pre-determined beginning, middle, and end to the film's story. There was a sense of a genre, but there was no apparent reason for why the things in the story were happening at all. The audience simply seemed to be watching what appeared to be an animated stream of conscience with no pre-defined middle or end to it in sight; essentially a film on autopilot. This strategy may work well for something such as a game demo, but for an animated film, it creates a very confusing and frustrating experience for everyone involved. The audience needed to know why everything that they were seeing was there in the first place. They needed to know how the world that they were seeing functioned on a micro and macro level. Nothing an audience sees should appear out of place unintentionally. The audience must also feel a sense of direction and progression while watching a film at all times, no matter how abstract the film's content is. Experiencing this level of frustration with the project ultimately led to a long period of introspection in order to seek out exactly what purpose the project was intending to serve. Eventually, there was an arrival at the conclusion that the project simply tried too hard to break the mold. If what the project was seeking to do was provide its audience with 5-7 minutes of extraterrestrial suspense, then there was nothing wrong with taking a more traditional route in that regard. Once this resolution became quite clear, the first issue to contend with was writing a solid story for the film that contained a boldly defined beginning, middle, and end.



LO-FI SCI-FI [PROCESS - CONT'D]

One way in which this tremendous challenge of organizing the story was overcome was by studying conventional literature such as *The Insider's Guide to Creating Comics and Graphic Novels*.¹⁴ This particular book aided in gaining a better understanding of the process of writing in general as well as many different ways to avoid and overcome the various challenges associated with writing. Prior to writing *Code Premonition*, there wasn't much practice that involved writing a legitimate story, especially one for a film. Upon beginning the writing process for the film, there was a realization that not only was there a need to learn how to write a story properly, there was also needed to learn how to write a good cinematic treatment for whatever the story would ultimately be about. This meant that there was a need to learn how to optimize the writing of a story so that it would translate into a well produced visual/audio experience. Texts such as *The Insider's Guide* helped to break down the writing process into several different stages such as: brainstorming, detailing The Four W's (who, what, where, when and often how), organizing a flow of events, developing a shooting script (Fig. 5), etc.

After there was a sense of satisfaction and confidence upon reviewing the aforementioned literature, a search for cinematic inspiration began. This search would be the proper guide in the right direction to creating a fun and entertaining lo-fi sci-fi experience.¹⁵

The search for inspiration is indeed the stage in which the real fun in developing the final version of *Code Premonition* truly began.

¹⁴ Andy Schmidt, *The Insider's Guide to Creating Comics and Graphic Novels* (Ohio: IMPACT, 2009), 12–27.

¹⁵ Liam Clark, "21 Great Lo-Fi Sci-Fi Films You Need To Watch," *Taste of Cinema*, January 29, 2014, accessed June 7, 2016, <http://www.tasteofcinema.com/2014/21-great-lo-fi-sci-fi-films-you-need-to-watch/>.

Figure 5 - Lab Scene Script & Dialogue

Scene Description: The lab scene opens with a close-up, top-down shot of a large hornet being closely monitored under the eye of a surveillance camera*. The hornet is being held in a small, hi-tech laboratory chamber. The voices of two surveyors can be heard commenting on the current situation. These characters are off screen.

(Close-up shot of the hornet)

Captain Hartford: "We online?"

Agent Myers: "Yessir."

Captain Hartford: "Good, let's give her some space."

(Camera pulls out to reveal entire stage)

Captain Hartford: "Perfect. How is she?"

Agent Myers: "She seems to be holding up pretty well actually, even though she's currently on muscle relaxers to prevent her from flying during the trial. She's being a good sport about it."

Captain Hartford: "Good. How is the Sentium prep going?"

(Camera cuts to Sentium hub chamber, onscreen UI prompt identifies Sherlock and the Sentium hub)

Agent Myers: "Sherlock is extracting a fragment from the hub. He's ready to move in on your mark."

(Camera cuts back to Hornet's Nest)

Captain Hartford: "Excellent. We're all set, bring him in... Myers?"

Agent Myers: "S-sorry, sir."

Captain Hartford: "Myers, if you have something to say, say it now."

Agent Myers: (determined) "Captain, this trial could compromise the entire mission and I recommend we motion for termination!"

Captain Hartford: "Why?"

Agent Myers: "Because our lives may be in danger, sir! I've been conducting off-the-record tests on some of the Sentium samples we've collected so far and they show that---"

(A communications device rings off in the distance, Captain Hartford goes and takes the call)

Captain Hartford: (sigh with a groan) "One second, Myers."

Agent Myers: (sigh) “Yessir.”

(Camera cuts to Sentium hub chamber at some point during Hartford side conversation, camera zooms in on the goings-on)

Captain Hartford: (off in the distance) “Captain Hartford speaking... Yes... Yes, I’m aware of that... Understood.”

Agent Myers: (sigh during Hartford conversation)

(Captain Hartford hangs up the communication device’s receiver, makes his way back to Agent Myers, scene switches back to Hornet’s Nest)

Captain Hartford: (aggravated sigh) “Ok look, Myers, we’re out of time.”

Agent Myers: (determined) “But Captain, my tests show that---”

Captain Hartford: (assertively) “We all know the risks going into this mission and we have a contract to fulfill. The best thing we can do now is proceed with caution. Is that understood?”

Agent Myers: (softly and angrily) “Yessir. Sherlock is ready on your mark.”

Captain Hartford: “Bring him in.”

(Camera switches to Sentium Chamber to show Sherlock carrying a Sentium fragment into the Hornet’s nest. Camera switches to Hornet’s Nest.)

Captain Hartford: “Careful...”

(As Sherlock approaches Angel with the Sentium sample, the camera zooms into the situation between Sherlock and Angel. Angel attempts to elude Sherlock in her discomfort, Captain Hartford notices the UI prompt that indicates a rise in the chamber’s radiation levels and inquires.)

Captain Hartford: “What’s going on?”

Agent Myers: “The radiation levels in the chamber are rising, sir! If they get too high, they could kill Angel!”

(The Hornet’s Nest’s lights start to flicker, odd noises can be heard, the Sentium draws itself nearer to Angel, camera zooms in, scene builds to a crescendo.)

Captain Hartford: “Back him away from her, Myers!”

Agent Myers: (panic breaths)

Captain Hartford: “Back him away!”

Agent Myers: “I’m trying, sir! His pairing node isn’t responding!”

(Lights go out, alien sounds can be heard in the darkness. Aura of Angel's Sentium mutation appears in the darkness.)

Agent Myers: (gasps)

Captain Hartford: "Dammit! What happened?"

Agent Myers: "I don't know, sir!"

Captain Hartford: (quick sigh) "Keep calm! Get the reserve lights online!"

Agent Myers: "They're non-functional!" (pause) "Wait, I've regained connection with Sherlock's pairing node! Accessing his onboard lighting system now."

(Sherlock's lights come on. They search for angel in the darkness of the Hornet's Nest. Alien sounds can still be heard in the darkness.)

Captain Hartford: "What the hell is that sound?"

(On screen UI prompt indicates the presence of a life form connected to the sound.)

Agent Myers: (nervously) "I'm not sure, Captain. The readings still indicate that there are only two life forms in the chamber: Sherlock and Angel."

Captain Hartford: "Try and get us closer to the sound. Be careful."

(On screen UI prompt indicates that the proximity is closing between the sound and Sherlock. Sherlock finally locks onto to Angel's position in the dark and Angel deals a single death blow to Sherlock.)

Agent Myers: (gasp)

Captain Hartford: "What the hell...?"

(Both scream)

(Angel strikes and the lights come back on. Sherlock lays destroyed in a corner. Alarm sounds in the back ground. Camera zooms in on Angel's mutation in full detail.)

Captain Hartford: "Impossible..."

Agent Myers: (scared whisper) "Oh my god..."

(Angel blasts through the divider between the Hornet's Nest and The Sentium Hub and enters the Sentium Hub.)

Captain Hartford: "Where the hell is it going?"

Agent Myers: "It's trying to get to the Sentium, Captain!"

Captain Hartford: "Laser perimeter now!"

(Laser perimeter forms around Sentium Hub. Laser guns fire at Angel. Using a magnet trick, Angel turns the lasers on one another and causes them to destroy each other.)

Captain Hartford: "Dammit, we can't stop it! Evacuate, Myers! Go! Go!"

Agent Myers: (scared gasp)

(As Angel draws closer to the Sentium, the scene builds to another Crescendo and cuts to the title.)

End

**: Entire lab scene is viewed in the first person from a top-down (bird's eye) perspective through the eye of the surveillance camera.*



LO-FI SCI-FI [PROCESS - CONT'D]

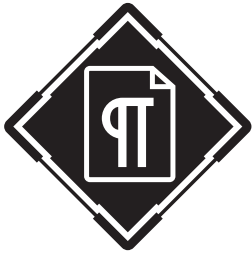
Not only did this stage greatly influence the direction of the project's writing, it also aided in creating more suitable characters and animation backdrops that reflected the time period of the story. It also aided in designing the audio for the project as well, a process that is so easily underappreciated when it comes to suspense and horror films. As was previously acknowledged, the main sources of inspiration happened to include some very favorable science fiction, horror, and suspense films and game software. Two of these intellectual properties in particular are *Dead Space*¹⁶ and *Alien Isolation*.¹⁷

The main overall source of inspiration for *Code Premonition*, especially as it pertains to the story, treatment, sound design, and general presentation of the project, is an interactive IP¹⁸ entitled *Dead Space*. *Dead Space*'s ominous, unpredictable, and jump scare riddled presentation was the closest out of all of the other inspirational sources to the type of atmosphere that *Code Premonition* was looking to establish. For example, *Code Premonition* incorporates a pivotal usage of character dialogue in order to drive and control the flow of events within its main scene. This was inspired by *Dead Space*'s expert-level execution of character interaction and conflict. As visceral as *Dead Space*'s third-person perspective presentation is to play, there was a feeling that the content within *Code Premonition*'s dialogue would have a greater impact on the audience if what they were experiencing visually was in the first-person like in *Alien: Isolation*; the second main source of inspiration for the project.

¹⁶ *Dead Space*. Original Version (PS3). [Electronic Arts]. Visceral Games (EA Redwood Shores). 2008. Video Game.

¹⁷ *Alien: Isolation*. Original Version (Multi-platform). [Sega]. Creative Assembly. 2014. Video Game.

¹⁸ Or *video game* in this context. *IP* is an acronym for *Intellectual Property*.



LO-FI SCI-FI [PROCESS - CONT'D]

Alien: Isolation was yet another special source of inspiration for Code Premonition because it influenced most of the visual design direction of the project. Since the story of Code Premonition takes place in the late 70's, there was a need for the project to possess a classic look and feel like films of the late 70's and 80's; almost as a great excuse to avoid getting caught up in the clutter of HD era content. Alien: Isolation is also an interactive IP that is an offspring of Ridley Scott's classic sci-fi/horror thriller Alien.¹⁹ Despite being developed using cutting edge technology, the visual design of Alien: Isolation impressively harks back to its older kin's soft, grainy and fidgety VHS format picture quality, hefty and clunky futuristic technology and weaponry, and dark, desolate goose-bump inducing environments. For Code Premonition, I wanted to make heavy use of these three key visual elements in particular; even though they would require a certain degree of adaption in certain instances.

Once the gathering of inspiration was completed, the story and visual presentation concepts (Fig. 6 - 8) were assembled and the production stage commenced.



A JOURNEY RECOUNTED: PRODUCTION

The production stage of Code Premonition mostly revolved around the production of finalized artwork, animation, video editing, and sound design.

Now that the story possessed more of an air of confidence to it, it was even more important that the visuals of the story reflect this confidence. There could be nothing out of place; everything that was able to be viewed on screen needed to have a specific function within the story. Due to the story's new direction, many visual elements in previous versions of the film were eliminated and replaced with only the necessary set pieces.

¹⁹ *Alien*, DVD, directed by Ridley Scott (1979; Century City Los Angeles, CA: 20th Century Fox Home Entertainment, 2004).



LO-FI SCI-FI [PROCESS - CONT'D]

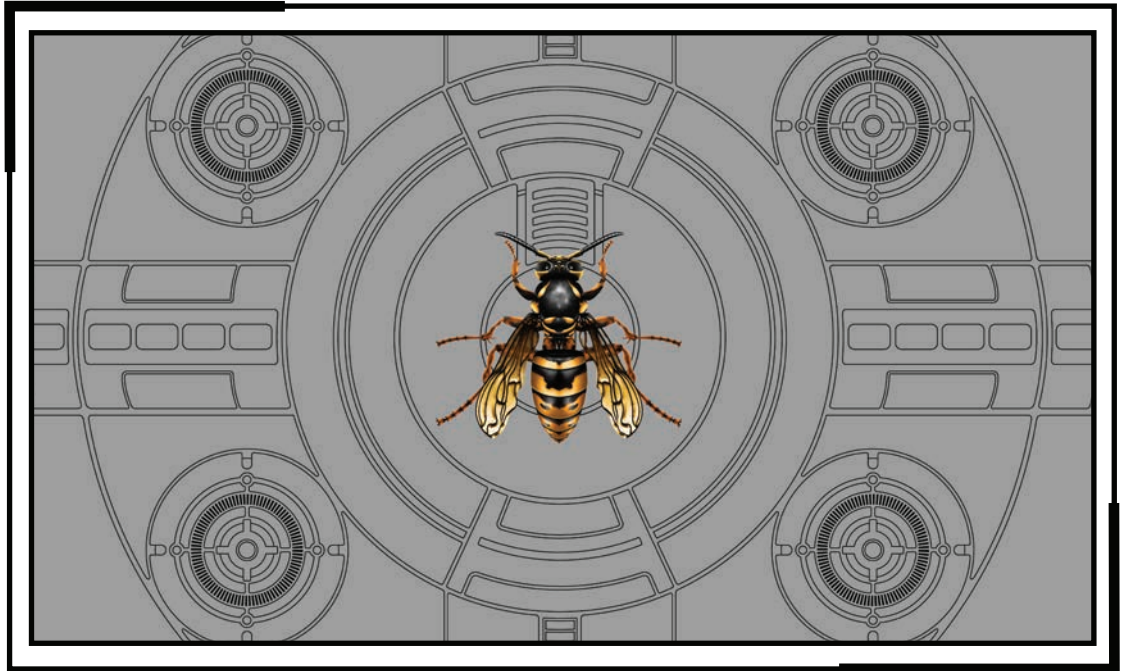
The initial artwork (line work / Fig. 9 - 11), which includes both animated characters and their associated environments, was designed using Adobe Illustrator. The final artwork (Fig. 12-14), that is the fully rendered versions of both animated characters and their associated environments, was created using Adobe Photoshop. After all of the artwork was completed, it was then imported into Adobe AfterEffects for animation. Both animated characters, more specifically Angel, arguably the most sophisticated visual asset in the entire project, was imported into AfterEffects from Photoshop in multiple layers. This was due to the fact that each separate layer often corresponded to one of her movable appendages (i.e. her wings, legs, antennae, etc).

Once the characters were imported into AfterEffects, they were rigged using Duik. Duik allows the user to rig highly customizable 2-dimensional animated characters (such as Angel) using null objects as IK controllers. As the rules also apply in traditional 3D software environments, all of these null objects function as part of a manipulable skeletal hierarchy, with the core of the hierarchy being one central null object (IK controller). Once the rigging process is complete, the null object hierarchy can be animated and keyframed like usual. To make the movement of Angel in particular more realistic, film study of wasps in their native environment was conducted. For example, wasps tend to exhibit quite a bit of erratic behavior in terms of their movement, especially when it comes to their flight patterns. This would indeed create a major problem in a controlled animation environment. To resolve this, the ability for Angel to fly was deliberately removed and her movement was limited to crawling only. The gravitational pull of her environment also caused her to move much slower than a regular wasp. Despite her disabilities, her movement still appeared convincing. Inside of AfterEffects, the character animation also required that individual characters be kept within their own separate compositions as it pertained to animating their own individual actions.

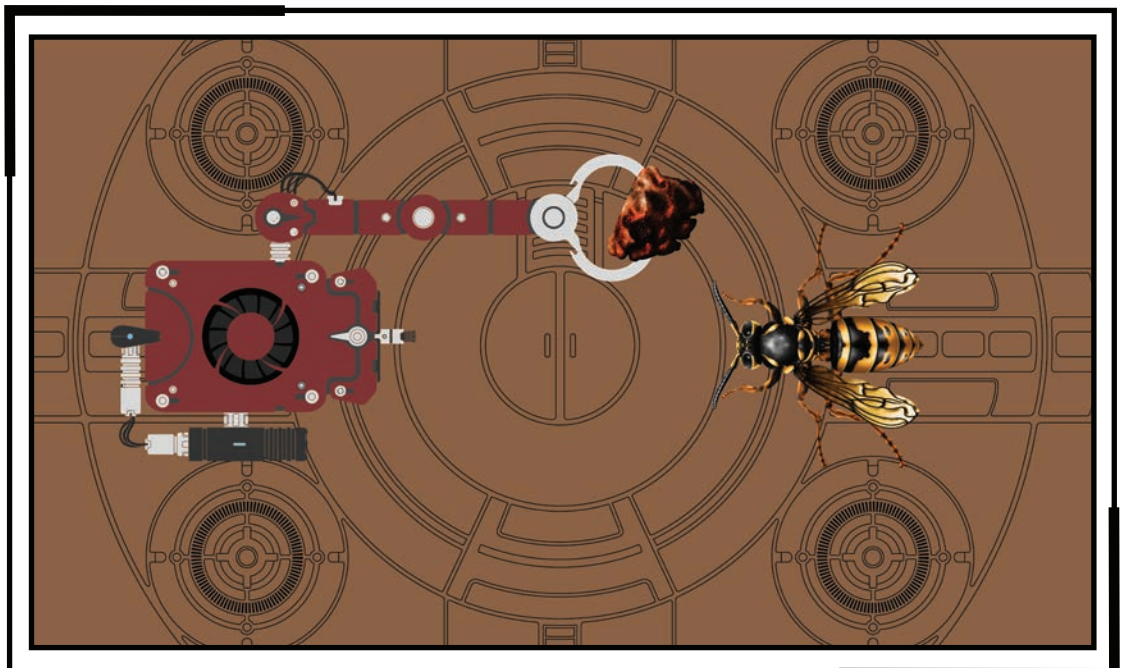


LO-FI SCI-FI [PROCESS IMAGES - 02]

STORYBOARD CONCEPTS [VISUAL ASSETS]



► FIGURE 6 [HORNET'S NEST CONCEPT]

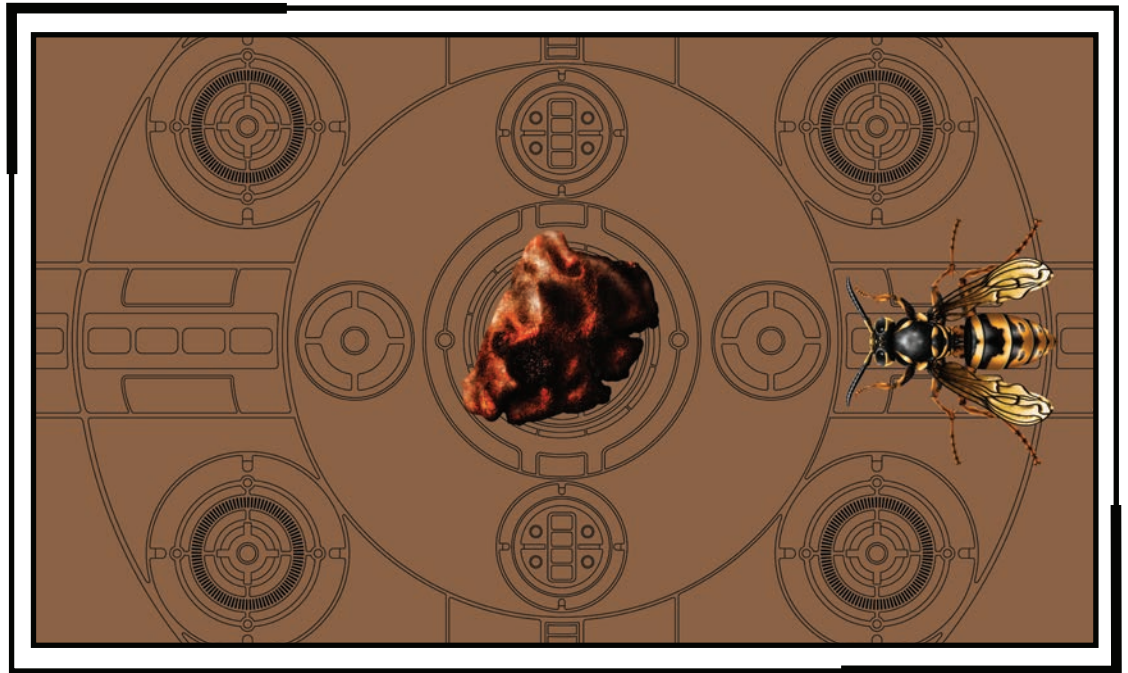


► FIGURE 7 [HORNET'S NEST SPATIAL RELATIONSHIP CONCEPT]

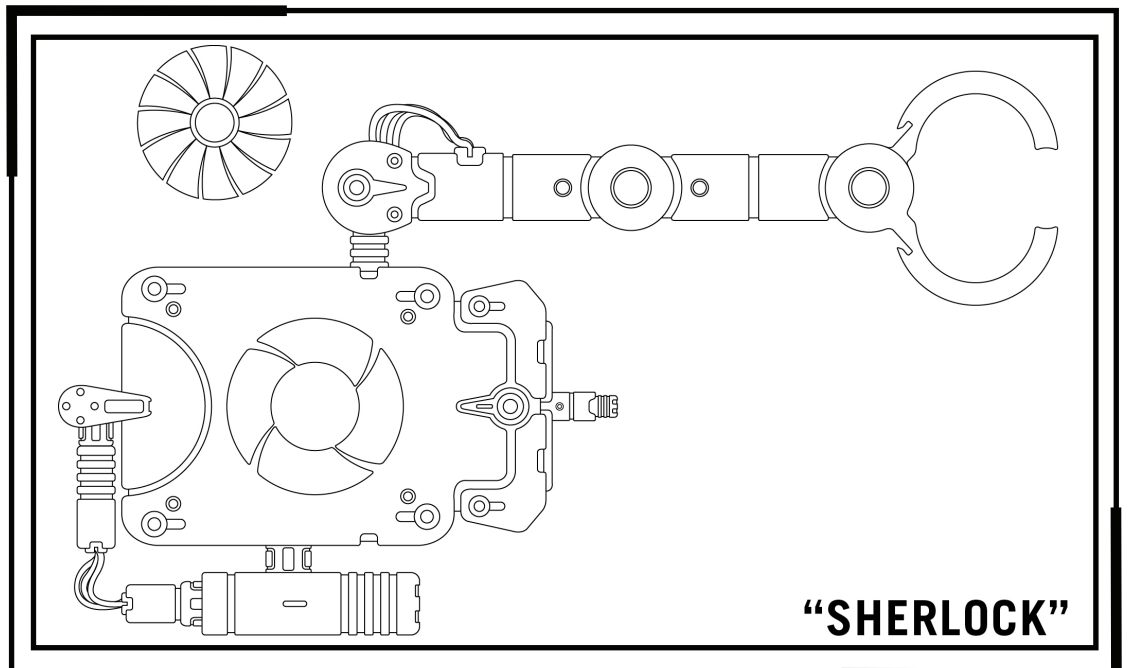


LO-FI SCI-FI [PROCESS IMAGES - 03]

STORYBOARD CONCEPTS [VISUAL ASSETS]



► FIGURE 8 [SENTIUM CHAMBER CONCEPT]

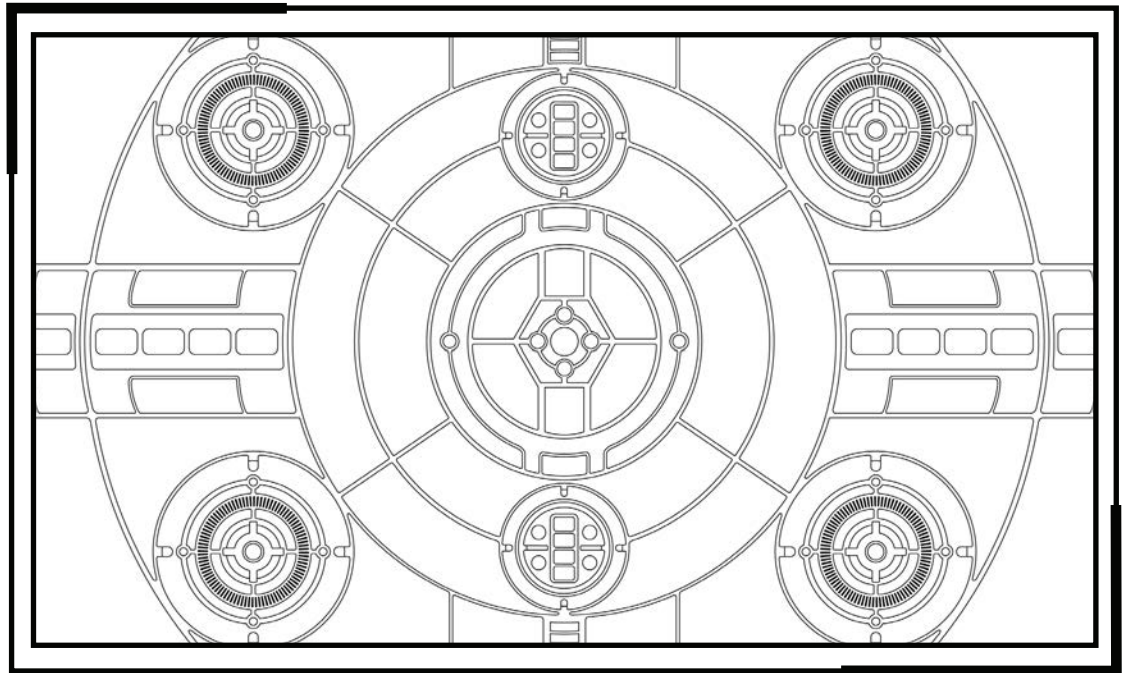


► FIGURE 9 [SHERLOCK 1.0 CONCEPT]

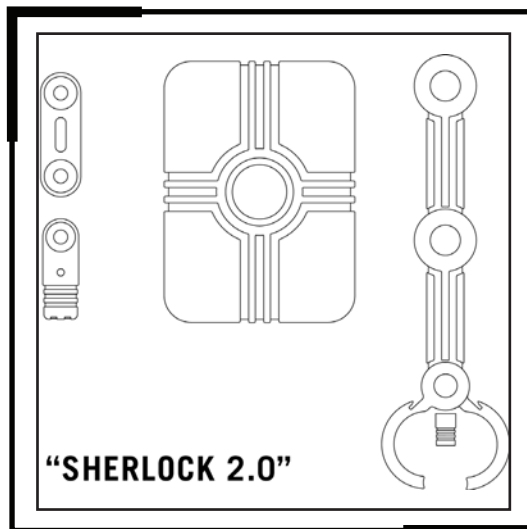


LO-FI SCI-FI [PROCESS IMAGES - 04]

STORYBOARD CONCEPTS [VISUAL ASSETS]



► **FIGURE 10 [SENTIUM CHAMBER LINE CONCEPT]**



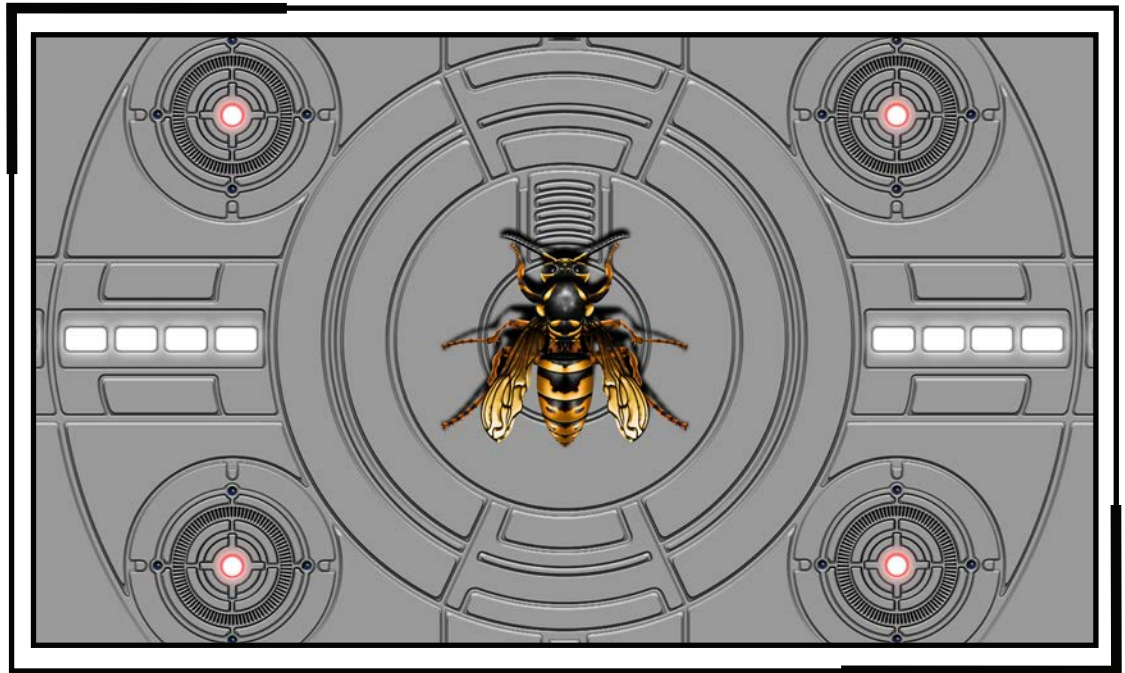
► **FIGURE 11
[SHERLOCK 2.0 LINE CONCEPT]**

A basic line concept render of "Sherlock", the second animated character featured in *Code Premonition*. Sherlock's final appearance was altered due mainly to its basic functionality within the film as well as the need to reduce the amount of computing power needed to render its animation.

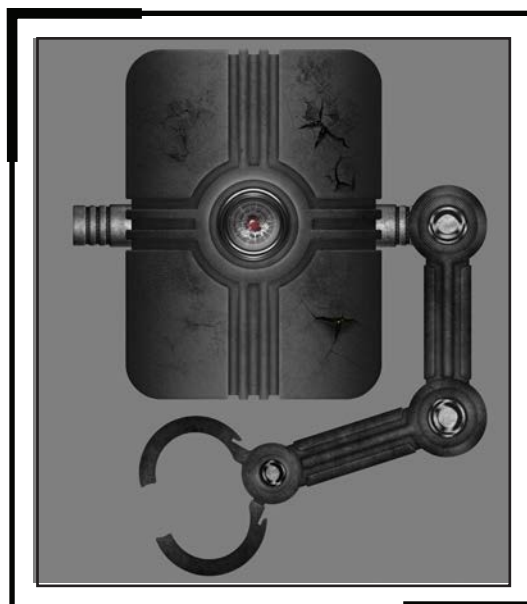


LO-FI SCI-FI [PROCESS IMAGES - 05]

FULL RENDERS [VISUAL ASSETS]



► **FIGURE 12 [HORNET'S NEST FULL RENDER]**



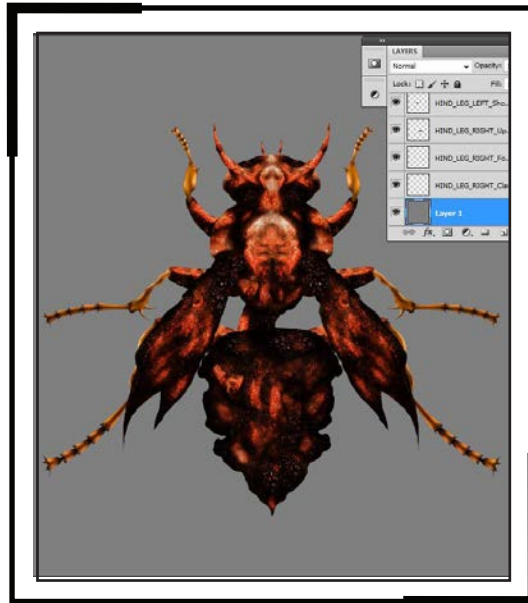
► **FIGURE 13
[SHERLOCK DAMAGE RENDER]**

A render of the damage model for Sherlock.



LO-FI SCI-FI [PROCESS IMAGES - 06]

FULL RENDERS [VISUAL ASSETS]



► **FIGURE 14**
[MUTANT ANGEL RENDER]

A screen capture of the mutated (Sentium infected) version of Angel inside of Adobe Photoshop. The construction of all animated characters in Code Premonition involved the same process of producing layered artwork inside of Photoshop which was then imported into Adobe AfterEffects to be rigged and animated.



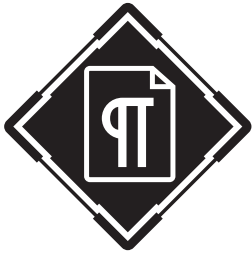
LO-FI SCI-FI [PROCESS - CONT'D]

These character compositions were then placed into a unified composition which also housed the animation backdrop. This allowed the characters to interact with one another as well as the environment; making for a multi-level animation environment.

Before any finalized animation could be completed, a dry run, or animatic of the project was completed first in order to adjust the animation for timing issues. This was also a point in production where there was an opportunity to try certain things (i.e. - test special effects, coordinate camera movements, making sure actions and dialogue properly matched, etc.) in order to see how well they did or did not work. Multiple meetings with thesis advisors helped to tighten any loose end at this stage.

Sound design is an art form and an element in film-making that horror and suspense films often use on equal terms with visual design. The decision to include voice acting in particular in the final version of Code Premonition came as a recommendation from thesis advisors. The inclusion of voice acting in the film provides the audience with an element of realism as well as a tempo, definitive mood, and direction that the film is moving in. As opposed to previous versions of the film, voice acting rids the film of ambiguity and also adds verbal details to the mood and setting. Meetings with thesis advisors helped to edit the content of the dialogue, making the flow of conversation or banter between the voice actors sound more natural and convincing. The addition of dialogue also helps to solidify the film's first-person experience; with moment to moment actions generating character commentary that leads the audience through the conflict of the film as though they are a part of it.

For the more general sound design featured in Code Premonition, hundreds of different sounds from a multiple collections of various royalty-free sound libraries were used.



LO-FI SCI-FI [PROCESS - CONT'D]

These libraries contain sounds ranging from background music, to animal roars and growls, to barely audible, high-pitched, sub-sonic electric hisses. Assembling as many layers of sound together as possible is another level of strategic design that creates cinematic depth. Good sound design causes the audience member to buy into whatever they are experiencing visually with more certainty and confidence; even if that person also knows in the back of his or her mind that what they are experiencing is not real. This particular aspect of production was thoroughly enjoyable and there is a desire to learn more about this art form in the future. It was a nice way of balancing out what can sometimes be the monotony of visual design.

Once the project was completed up to a point where preliminary animation was able to show a solid beginning, middle, and end to the story, multiple meetings with thesis advisors were conducted to move the film into its finalized result (Fig. 15 - 18).



A JOURNEY RECOUNTED: POST-PRODUCTION

The post-production stage of Code Premonition mostly involved the process of finalizing animation, adjusting the visual integrity of the film (color correction, blurring and sharpening, etc.), adjusting sound quality, editing the film for timing, and placing the film into a solid and cohesive unified piece.

As of the time of this writing, there are currently two different versions of Code Premonition that are available. One particular version offers an extended account of the details surrounding the events of the film. The second version offers a more direct approach, which drops the viewer almost directly into the thick of the main ordeal of the film. The decision to pursue developing the film in this fashion came as a result of multiple pre-screenings for select target audience members (i.e. – close friends and family) as well as multiple meetings with thesis advisors (also a part of the target audience).



LO-FI SCI-FI [PROCESS - CONT'D]

The project seemed to lend itself to serving two different factions within the same target audience. There was a select group of audience members that enjoyed a more fast-paced, YouTube style presentation of the film that would drop them directly into the fray. This type of experience is of course less time consuming to enjoy and would require much less consideration of the outside details surrounding the events in front of them. The other faction enjoyed a more traditional, extended version of the film that uses the film's back story to build up to the events that lead up to the main ordeal. This version also allows the audience to appreciate the more subtle science-fiction side of the film much more.

Despite there being two different versions of the film, both versions of the film required a significant amount of editing to chop down moments where perhaps there was a lull in progression, action, or dialogue. This made the flow of the film appear to be more natural and direct to the point. The more that was done in the way of editing, the more engaging the overall experience became.

After post production was completed, the film was uploaded to YouTube for private viewing. The following section provides a brief summary of the feedback that was provided by the members of the viewership.

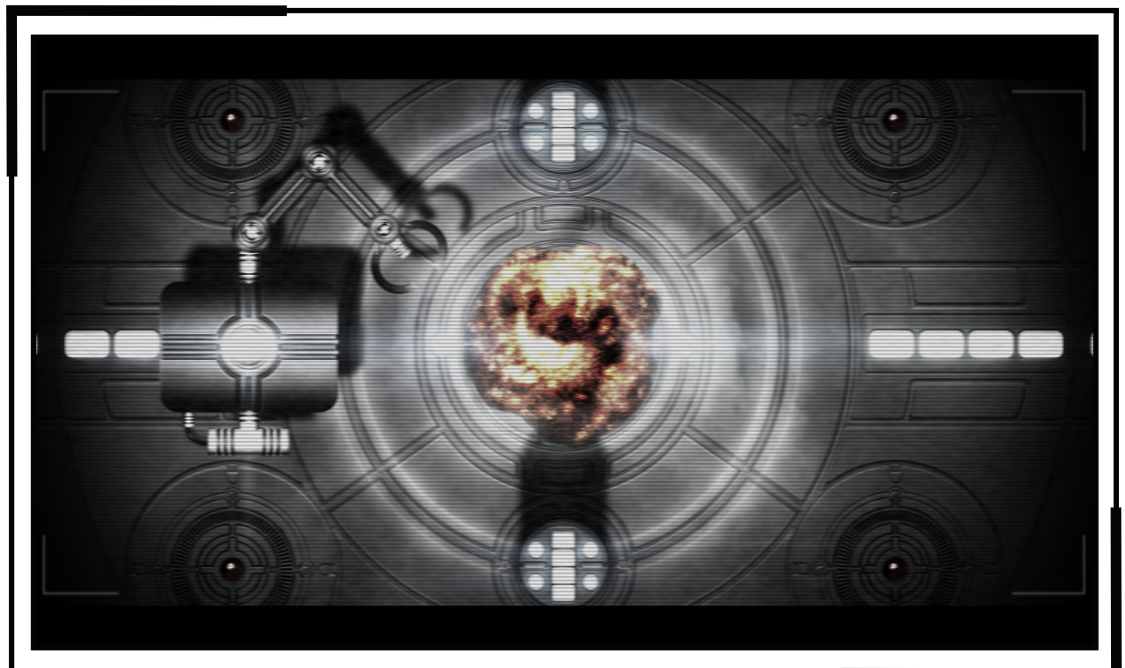


LO-FI SCI-FI [PROCESS IMAGES - 07]

POST-PRODUCTION RENDERS [SCREEN CAPTURES]



► FIGURE 15 [POST PRODUCTION CAPTURE 00]



► FIGURE 16 [POST PRODUCTION CAPTURE 01]



LO-FI SCI-FI [PROCESS IMAGES - 08]

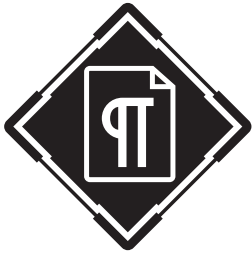
POST-PRODUCTION RENDERS [SCREEN CAPTURES]



► FIGURE 17 [POST PRODUCTION CAPTURE 02]



► FIGURE 18 [POST PRODUCTION CAPTURE 03]



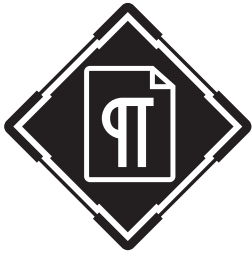
AFTERMATH [SUMMARY]



THE VOICE OF THE MASSES

As was previously expressed, the main overall challenge that was contended with during the conceptual stage of Code Premonition's development was writing a logical and entertaining story from which a viable cinematic treatment could be produced. This trial and error process, which took a couple of years, produced several versions of the story and treatment until a feasible solution emerged.

In order to ensure that a logical and entertaining final product was successfully created, a survey of the viewership was conducted in order to confirm the results (Fig. 19-21). The first couple of questions on the survey essentially ask the viewer their age and gender. This was important because it was discovered that most of the people who watched the film were part of the target demographic. There was also the discovery that the film seemed to demand more attention from men than women, although there is no concrete answer as to why. The second group of questions asks the viewership if they were able to follow the film's story and if they liked or disliked its presentation. Overall, the viewership seemed to be very enthusiastic about how the cinematic treatment of the story was able to maintain their attention throughout the film's duration and how it also left them wanting more from the film. The final question asks the viewership to comment on ways in which they see the project being improved. A good majority of the viewership was interested in improving the quality of the voice acting in particular. There were pivotal moments in the film where the action may have delivered and the voice acting was not properly executed to assist these moments. If the voice acting could be rewritten and re-recorded, there is a good chance that opportunity would be taken advantage of. Some viewers also wished to see the inclusion of what direction the story was headed in next instead of witnessing an abrupt ending with no particular follow through. This is a specific point that, if there was more time available, would be fixed and included in the final product.



AFTERMATH

[SUMMARY - CONT'D]

Overall, there is a delight in knowing that most of the feedback that was received came from members of the target audience (adults over the age of 25). And last but certainly not least, the feeling of knowing that this project has satisfied most of its conceptual goals and requirements is a feeling like none other!



AFTERMATH [SUMMARY IMAGES - 00]

AUDIENCE MEMBER SURVEYS [VIEWER FEEDBACK]

**[CODE PREMONITION]™
USER SURVEY**

WHAT IS YOUR GENDER?

☒ Male
☐ Female

WHAT IS YOUR AGE GROUP?

☐ 12-20 ☐ 20-30 ☐ 30-40 ☐ 40-50 ☒ Over 50

WERE YOU ABLE TO UNDERSTAND CODE PREMONITION'S PLOT (STORY)?

☒ YES ☐ NO

WHAT IN PARTICULAR DID YOU LIKE AND/OR DISLIKE ABOUT CODE PREMONITION?

*The graphics were really good and it flowed pretty good
as far as a mission and its intent is concerned*

ADDITIONAL COMMENTS

Good job

► FIGURE 19 [SURVEY ONE]



AFTERMATH [SUMMARY IMAGES - 01]

AUDIENCE MEMBER SURVEYS [VIEWER FEEDBACK]

**[CODE PREMONITION]™
USER SURVEY**

WHAT IS YOUR GENDER?

☒ Male
☐ Female

WHAT IS YOUR AGE GROUP?

☐ 12-20 ☐ 20-30 ☐ 30-40 ☒ 40-50 ☐ Over 50

WERE YOU ABLE TO UNDERSTAND CODE PREMONITION'S PLOT (STORY)?

☒ YES ☐ NO

WHAT IN PARTICULAR DID YOU LIKE AND/OR DISLIKE ABOUT CODE PREMONITION?

THE ANIMATION & STORY WERE REALLY WELL DONE
REALLY GOOD EFFECTS.
GOOD ATTN TO DETAIL WITH BREATHING OF THE HORNET

ADDITIONAL COMMENTS

I THINK the only comment would be to have more agency
in the voices after the hornet gets hit, they seem monotone

► FIGURE 20 [SURVEY TWO]



AFTERMATH [SUMMARY IMAGES - 02]

AUDIENCE MEMBER SURVEYS [VIEWER FEEDBACK]

**[CODE PREMONITION]™
USER SURVEY**

WHAT IS YOUR GENDER?

☐ Male
☒ Female

WHAT IS YOUR AGE GROUP?

☐ 12-20 ☐ 20-30 ☐ 30-40 ☐ 40-50 ☒ Over 50

WERE YOU ABLE TO UNDERSTAND CODE PREMONITION'S PLOT (STORY)?

☒ YES ☐ NO

WHAT IN PARTICULAR DID YOU LIKE AND/OR DISLIKE ABOUT CODE PREMONITION?

I like the intro to the ~~the~~ story. Its flow was easy to understand. The result was intense and intriguing. I like it and want more... What happened to the bug?

ADDITIONAL COMMENTS

► FIGURE 21 [SURVEY THREE]



UNPREDICTABLE [CONCLUSION]



ENDLESS POSSIBILITIES

Producing a project such as Code Premonition can be a very enlightening and life-changing experience for any first-time film maker/story teller. The learning curve may be steep, but if the visionary respects the integrity of the craft that is film-making and is also fully devoted to maximizing on the potential of the experience he or she is trying to create, then that person will do their best to put forth their best efforts. From where Code Premonition started to where it is now, it has certainly improved tremendously; there are no complaints. Code Premonition, if nothing else, is a proof of concept that has done its job well. It is not a main course; it is only but an appetizer.

Code Premonition currently stands as the first complete project in what is designed to be a series of science fiction themed intellectual properties; each bearing the Code Premonition title in some form. Bearing an open-ended narrative concept, i.e. The X-Files²⁰ or The Twilight Zone²¹. Code Premonition has the massive potential to become its own successful brand; quite possibly extending its reach over into other forms of media such as graphic novels and videogames. Each new addition to the series will be designed with the intention of making it a definitive improvement over the last. As the start of a brand, Code Premonition is important because it provides the brand with a conceptual direction as well as a visual identity. It is responsible for creating an infinite amount of opportunities to tell an infinite amount of great science-fiction themed stories that titillate the imagination.

²⁰ *The X Files: Complete Series Collection*, DVD, created by Chris Carter (1993 - ; Century City Los Angeles, CA: 20th Century Fox Home Entertainment, 2006).

²¹ *The Twilight Zone: Complete Series Collection*, DVD, created by Rod Serling (1959-1964; Hollywood, Los Angeles, CA: Image Entertainment, 2011).



BIBLIOGRAPHY

- 01 *WIPO (World Intellectual Property Organization)*. "What Is Intellectual Property." Accessed June 2, 2016. <http://www.wipo.int/about-ip/en/>.
- 02 *Riddick*, Blu-Ray/DVD, directed by David Twohy (2013; Universal City, CA: Universal Studios Home Entertainment, 2014).
- 03 *Inception*, Blu-Ray/DVD, directed by Christopher Nolan (2010; Burbank, CA: Warner Home Video, 2010).
- 04 *The Terminator*, Blu-Ray/DVD, directed by James Cameron (1984; Culver City, CA: Sony Pictures Home Entertainment, 2006).
- 05 *The Matrix*, Blu-Ray/DVD, directed by Lana and Lilly Wachowski (formerly The Wachowski Brothers) (1999; Burbank, CA: Warner Home Video, 2007).
- 06 Barthelmess, Ulricke and Furbach, Ulrich. "*Do We Need Asimov's Laws?*" Thesis Document, Cornell University Library, 2014.
- 07 Romero, Frances. "End Times: Top 10 End-of-the-World Prophecies (Y2K)." *Time Magazine*, May 20, 2011. Accessed June 7, 2016. http://content.time.com/time/specials/packages/article/0,28804,2072678_2072683_2072599,00.html.
- 08 *Robocop*, DVD, directed by Paul Verhoeven (1987; Culver City, CA: Sony Pictures Home Entertainment, 2006).
- 09 Dunford, Bill and McKissick, Katie. "Planets – Io: In Depth." *NASA Online*, Accessed September 18, 2015. <http://solarsystem.nasa.gov/planets/io/indepth>.
- 10 Duduf.net. Accessed February 5, 2016. <http://duduf.net/index.php/products/after-effects/duik/>.
- 11 Schmidt, Andy. *The Insider's Guide to Creating Comics and Graphic Novels*. Ohio: IMPACT, 2009.



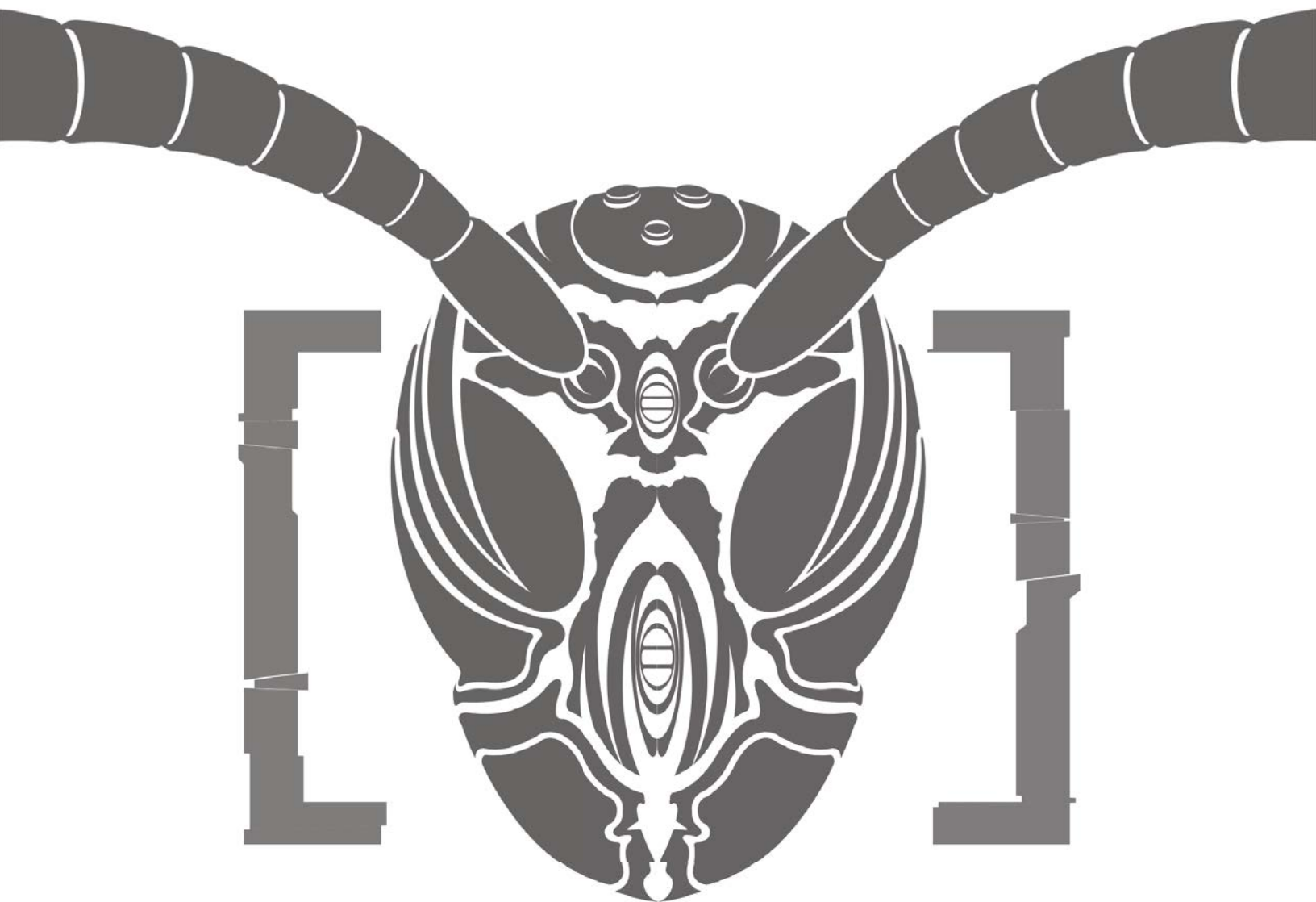
BIBLIOGRAPHY

- 12 Clark, Liam. "21 Great Lo-Fi Sci-Fi Films You Need To Watch." *Taste of Cinema*, Posted January 29, 2014. Accessed June 7, 2016.
<http://www.tasteofcinema.com/2014/21-great-sci-fi-films-you-need-to-watch/>.
- 13 *Dead Space*. Original Version (PS3). [Electronic Arts]. Visceral Games (EA Redwood Shores). 2008. Video Game.
- 14 *Alien: Isolation*. Original Version (Multi-platform). [Sega]. Creative Assembly. 2014. Video Game.
- 15 *Alien*, DVD, directed by Ridley Scott (1979; Century City Los Angeles, CA: 20th Century Fox Home Entertainment, 2004).
- 16 *The X Files: Complete Series Collection*, DVD, created by Chris Carter (1993 - ; Century City Los Angeles, CA: 20th Century Fox Home Entertainment, 2006).
- 17 *The Twilight Zone: Complete Series Collection*, DVD, created by Rod Serling (1959-1964; Hollywood, Los Angeles, CA: Image Entertainment, 2011).



CLASSIFIED

[APPENDIX]



[CODE.PREMONITION]TM

A 2D ANIMATION EXPERIENCE FEATURING DUIK TECHNOLOGY

JASON E. HARRIS

THESIS PROPOSAL FOR THE MASTER OF FINE ARTS DEGREE
VISUAL COMMUNICATION DESIGN
CIAS, SCHOOL OF DESIGN
ROCHESTER INSTITUTE OF TECHNOLOGY

THESIS PROPOSAL

MASTER OF FINE ARTS DEGREE
VISUAL COMMUNICATION DESIGN
CIAS, SCHOOL OF DESIGN
ROCHESTER INSTITUTE OF TECHNOLOGY

TITLE

[CODE.PREMONITION]
A 2D ANIMATION EXPERIENCE
FEATURING DuIK TECHNOLOGY

SUBMITTED BY

JASON E. HARRIS
OCTOBER 25, 2013

THESIS COMMITTEE

PROFESSOR CHRIS JACKSON
CHIEF ADVISOR
VISUAL COMMUNICATION DESIGN

PROFESSOR MARLA SCHWEPPE
ASSOCIATE ADVISOR
VISUAL COMMUNICATION DESIGN

ASSOCIATE PROFESSOR SHAUN FOSTER
ASSOCIATE ADVISOR
VISUAL COMMUNICATION DESIGN

THESIS PROPOSAL

MASTER OF FINE ARTS DEGREE
VISUAL COMMUNICATION DESIGN
CIAS, SCHOOL OF DESIGN
ROCHESTER INSTITUTE OF TECHNOLOGY

TITLE

[CODE.PREMONITION]

A 2D ANIMATION EXPERIENCE
FEATURING DuIK TECHNOLOGY

SUBMITTED BY

JASON E. HARRIS

OCTOBER 25, 2013

[ABSTRACT]

A BORROWED TECHNIQUE

Keywords | *2D Animation, 2D “Puppet” (“Cut-Out” Character) Rigging, Kinematics (FK/IK), Expressions/Scripts, Layers/Single Mesh, Adobe Photoshop, Adobe After Effects, Plug-In, Duduf (Doo-Duff) IK Toolset, Science-Fiction, Short Film*

In the field of computer animation production, the term “rigging” is conventionally used to describe a preliminary procedure, typically performed within 3D-oriented software applications (i.e. *Autodesk’s Maya*), that is basically required to convert an inanimate 3D model into a digital “puppet” that can be posed and/or animated.

However, it can be argued that within the past five years, this model definition has quite noticeably grown in complexity, as the practice of utilizing ‘rig-oriented’ design (ROD) as an animation technique has grown tremendously in popularity outside of the realm of 3D. Lo and behold, the technique has actually managed to seep its way into the 2D realm, as it is now being employed by various non-3D (2D/2.5D) oriented software applications (i.e. *Adobe Flash & Adobe After Effects*) that have put it to very impressive, extensive use.

The ultimate goal of this project is to provide a visual showcase of ROD as an animation technique from the perspective of a 2D software application via an animated short film produced in *Adobe After Effects* using the *DuIK Toolset*.

[PROBLEM.STATEMENT]

DuIK DOES IT BEST

DuIK Homepage | <http://duduf.net/?page_id=165>

Dan Ebbert's Motion Design Guide | <<http://www.motionscript.com/design-guide/ik.html>>

The removal of the 'Z-axis' has proven to be a non-factor in the introduction of ROD's transition into the 2D realm. However, by no means does this imply that the transition has been seamless. Many designers still complain about ROD's feeble implementation into 2D-oriented software applications such as *Adobe Flash (FLA)*, whose infamous 'Bone Tool' feature, for example, is still in desperate need of optimization. In any case, there is no optimization if there is no starting point. Now that some risks have been taken and the groundwork has been laid, ROD has experienced what (in my opinion) is its biggest breakthrough in the 2D realm in the form of the *DuIK Toolset* plug-in for *Adobe After Effects (AE)*.

Plug-Ins

Many design, animation, and production professionals around the world will acknowledge that AE is one of the most powerful, robust software applications in existence today. One key attribute that makes AE so special is its open-ended nature, especially its willingness to comply with the integration of other auxiliary pieces of software known as 'plug-ins' (or 'extensions') into the grand scheme that is its pre-existing framework.

Simply put, a plug-in is a small(er) software module that is designed to add beneficial functionality to a larger pre-existing software application. The added functionality that a plug-in offers can vary depending on its design as well as the application it was designated to compliment. Some plug-ins are used to improve the running efficiency of a software application, some are used to make the pre-existing features of an application easier to use, some are used to add entirely new features to an application, and some are even used to establish the means by which other plug-ins can be more easily integrated into the pre-existing framework of an application (as was previously noted). A good example of a common plug-in that is "visible" to the end user is the Adobe Flash Player, which is heavily employed by web video hosting websites such as YouTube.

In the case of AE, many designers would argue that it is the plug-ins, especially the ones provided by '3rd party' developers (developers that are neither owned by or dependent on Adobe), that truly allow AE to flex its visual muscle in specific areas where it perhaps wasn't able to really do so as effectively prior to the plug-in being introduced.

2D Puppet Rigging with DuIK

Utilizing AE's framework to rig and animate characters is not really anything new to the application. As a matter of fact, it is worth noting that the designer, without the help of DuIK, is more than capable of utilizing AE's native 'Puppet Tool' technology in combination with its powerful 'Expressions Editor' and

‘Null Objects’ framework to produce very impressive, highly sophisticated layered and/or single-mesh puppet rigs ‘by hand’, barring the designer lacks the technical expertise to achieve such results.

However, that last stipulation is very important and cannot be overlooked! What if the designer does lack the technical expertise to achieve these results? What if there are strict time constraints in place that do not allow the designer to produce intricate rig setups of such a high caliber? What if there is no money in the production budget to support an intricate rig based animation system (not to mention a series of them)? What if the designer is lazy and does not feel like being a Technical Artist on Tuesdays? Even having established this series of what-if scenarios, there is also still the issue that using AE in the aforementioned fashion is a bit unconventional, which is why the added functionality provided within a plug-in like *DuIK* is still necessary at this particular point in AE’s lifespan.

DuIK is an acronym that stands for DuDuf (“Doo-Duff”) Inverse Kinematics. It is a 3rd party extension developed for AE by French-Canadian film director and animator Nicolas Dufresne. Based on Dan Ebbert’s complex system of trigonometrical expressions, *DuIK* endows the designer with a powerful, simple-to-use tool that streamlines the process of setting up and animating puppet rigs which are formulated to utilize the logic of ‘Inverse Kinematics’ (IK). The tool works by allowing the designer to establish ‘digital joints’ (or ‘bones’) on the puppet that can be controlled via use of controller points in the form of AE’s own ‘null objects’, just as this process would work nearly identically in a 3D-oriented software application such as Maya. The logic of IK comes in handy when, for example, when a designer wishes to animate a realistic walk or run cycle on a humanoid character. As opposed to using Forward Kinematics (FK), which would animate the character’s limbs in a counter intuitive fashion starting with the shoulder/thigh and terminating at the hand/foot, IK allows the hand/foot to be the determining factor of how the rest of the leg/arm should animate along with it. Whether a puppet utilizes a single mesh, a series of layers, or a combination of both *DuIK* is powerful enough to integrate smoothly into any system. Not only can *DuIK* be used to add the benefits of IK functionality to a rig (quite literally at the touch of a button), *DuIK* can also be used to add a high degree of precision control to various animate-able attributes of a character rig such as ‘exposure’ and ‘oscillation’.

I do hope that *DuIK* becomes a core component of AE in the future, as this project aims to showcase the unique functionality that it provides.

[SURVEY_OF_LITERATURE]

INSPIRATION & SOURCES OF TUTELAGE

PRINT

The Mass Effect Series (Novels)

Karphyshyn, Drew. Mass Effect: Revelation, Ascension, Retribution. Canada: Del Ray/Ballantine Books, 2007-2010.

These books are based on one of my absolute favorite videogame trilogies of all time. Since I am new to experimenting with story-telling in written form, especially in the realm of science-fiction, I figured that these books would be a good place to start in terms of providing aspiring science-fiction writers with a good sense of structure.

Storyboarding: Turning Script To Motion

Torta, Stephanie, and Vladimir Minuty. Storyboarding: Turning Script to Motion. Virginia, Massachusetts: Mercury Learning and Information, 2011.

This book provides the reader with a thorough, in-depth framework of how to go about converting the written word into a series of images used to tell a story. It is recommended for individuals, such as myself, who are new to the world of visual story-telling in motion and would like to dive right in.

The Game Animator's Guide To Maya

McKinley, Michael. The Game Animator's Guide to Maya. Indiana: Wiley Publishing Inc., 2006.

A book that provides the 3D game animator with an introduction to using Autodesk Maya's framework for animation. It starts the reader off at "the beginning" with the 12 Principles of Animation, then works its way up to fully rigging and animating characters. This book is quite useful in helping me translate the logic of rig-oriented design as an animation tool from the realm of 3D to the realm of 2D.

How To Cheat In Adobe Flash CS4: The Art of Design and Animation

Georgenes, Chris. How To Cheat In Adobe Flash CS4: The Art of Design and Animation. UK: Elsevier Ltd., 2009.

A book that teaches the reader how to learn the ins and outs of Adobe Flash in a fast and efficient way. It provides the reader with full color, project driven examples that help streamline the learning process. This book devotes a significant amount of space to discussing the 'Bone Tool' and its IK capabilities in depth. Version CS4 marks the entry of the 'Bone Tool' into Flash's design toolset.

Flash + AfterEffects: Add Broadcast Features To Your Flash Designs (2nd Edition)

Jackson, Chris. Flash + AfterEffects: Add Broadcast Features To Your Flash Designs (2nd Edition). UK: Elsevier, 2010.

A book that provides both Flash and AfterEffects designers with innovative ways to combine the two software technologies in order to create impressive projects. Designers can learn how to render Flash

files that contain ActionScript and incorporate them into AfterEffects projects or turn rendered compositions in AfterEffects into an interactive gaming experience. With the help of this book, the designer is only limited by their imagination.

CASE STUDIES

e.d. Films: From Paper to After Effects (Revisited)

YouTube/Daniel Gies. "e.d. Films: From Paper to After Effects (Revisited)." Last modified January 16, 2013. <https://www.youtube.com/user/everyonediesfilms/videos>.

This is the second edition in a series of tutorials hosted by Canadian artist, animator, and film maker Daniel Gies. This series of tutorials guides the designer from start to finish on how to design and animate a 2D puppet. From the creation of the character in Adobe Photoshop to importing, rigging, and animating the puppet in AfterEffects, this tutorial is essential for those who wish to learn about rigging and animating, especially using DuIK and other rigging techniques.

MotionScript.com – Expressioner's Design Guide: Inverse Kinematics Redux

MotionScript/Dan Ebbert. "Expressioner's Design Guide: Inverse Kinematics Redux." Last modified 2007. <http://www.motionscript.com/design-guide/ik.html>.

In this article, motion designer Dan Ebbert, via Inverse Kinematics (IK) expressions developed by Brian Maffitt, presents an extensive look at the "back-end" of the complex trigonometrical logic that the DuIK extension utilizes.

DuIK Tools – Inverse Kinematics for AfterEffects!

Vimeo/FAMOS. "DuIK Tools – Inverse Kinematics for AfterEffects." Last modified 2011. <http://vimeo.com/7872163>.

DuIK's first English language video tutorial hosted by "FAMOS", a subscriber on Vimeo.

DuIK Puppet Tools Inverse Kinematics – A Quick Intro

Vimeo/FAMOS. "DuIK Puppet Tools Inverse Kinematics – A Quick Intro." Last modified 2011. <http://vimeo.com/8141832>.

Another DuIK tutorial hosted by "FAMOS" on Vimeo.

[METHODOLOGICAL.DESIGN]

WHAT IS CODE PREMONITION?

Project Description

Code Premonition is a science-fiction, 2D animated short film that showcases the *DuIK Toolset* extension for *Adobe After Effects*. The project features layered artwork created in Adobe Photoshop and imported into *Adobe After Effects*, where it is organized to undergo the rigging process and then animated. The film will be approximately 2-5 minutes in length and produced using a 16:9 widescreen aspect ratio at a pixel dimension of 1280X720. *Sony ACID Music Studio* will be used to generate the soundtrack for the film.

Software Used

- Adobe Photoshop - For Producing Layered Artwork (Puppet Rigs)
- DuIK Toolset - For Rigging and Animating Layered Artwork
- Sony ACID Music Studio - For Producing the Musical Score
- Adobe After Effects - For Compositing the Final Product (Animated Artwork, Sound, Musical Score)

Plot Description and Characters

(See Shooting Script and Storyboards for details)

[DISSEMINATION]

(CLASSIFIED) DATA TRANSMISSION

Marketing

Code Premonition is initially slated to be showcased on my personal website <<http://cias.rit.edu/~jeh9511/YellowJacket/>> (currently in the process of being transferred and renovated) as well as on free web video exhibition websites (i.e. *YouTube* and *Vimeo*) and free social networking sites (i.e. *Facebook* and *Twitter*).

Depending on the success of the project, I would also like to submit the project to various comic book conventions such as *Comic Con*, where I hope it will spark the interest of industry leaders such as *Marvel* and *Dark Horse*.

I would also eventually like to submit the project to the *Adobe Design Achievement Awards* (ADAA).

Target Audience

Code Premonition is designed to appeal to a very wide audience. Young adolescents to adults (ages 12 and older) who have a strong passion for science-fiction comic books, videogames, movies and other related media can enjoy the experience. It is also designed to appeal even more heavily to animation professionals who are part of a similar demographic (age 18 and older). Even individuals who have had little to no exposure to the science-fiction genre and/or are new fans of science-fiction (such as myself) can enjoy the film!

Target Audience Personas

Persona A

Max Bridges

Description

A 12-year-old spoiled brat who plays entirely too many video games and reads very few books (unless they have lots of pictures). He is always publically proclaiming that *Pacific Rim* is the best movie he has ever seen in his entire life.

Persona B

Carrie Rogers

Description

A “30-something” year-old professional writer who loves spirituality in science-fiction. She enjoys books and movies that employ highly poetic sensibilities that break up the action elements. She doesn’t really like playing video games, but she has a great amount of respect for the spiritual sensibilities of *The Mass Effect Series*.

Persona C

Daniel Gies

Description

A talented young artist, animator and film maker who aspires to experiment with animation in new and innovative ways. He is a huge proponent of the technical fluidity that DuK offers for 2D animation professionals and hosts 2D Puppet Rigging tutorials online on *YouTube*.

[EVALUATION PLAN]

SITUATION ROOM PROCEEDINGS

The project’s success will depend heavily upon the verbal feedback it receives in the places where it is being hosted, especially on websites such as YouTube and Vimeo where it can be viewed. *Code Premonition* serves as my first endeavor in the realm of story-telling and film. Since I would like to grow as an artist in these two particular areas, it would do me a great service if my audience would be as constructive in their criticism of the project as possible.

[BIBLIOGRAPHY]

SURVEY OF LITERATURE

- **The Mass Effect Series (Novels)**

Karphyshyn, Drew. Mass Effect: Revelation, Ascension, Retribution. Canada: Del Ray/Ballantine Books, 2007-2010.

- **Storyboarding: Turning Script To Motion**

Torta, Stephanie, and Vladimir Minuty. Storyboarding: Turning Script to Motion. Virginia, Massachusetts: Mercury Learning and Information, 2011.

- **The Game Animator's Guide To Maya**

McKinley, Michael. The Game Animator's Guide to Maya. Indiana: Wiley Publishing Inc., 2006.

- **How To Cheat In Adobe Flash CS4: The Art of Design and Animation**

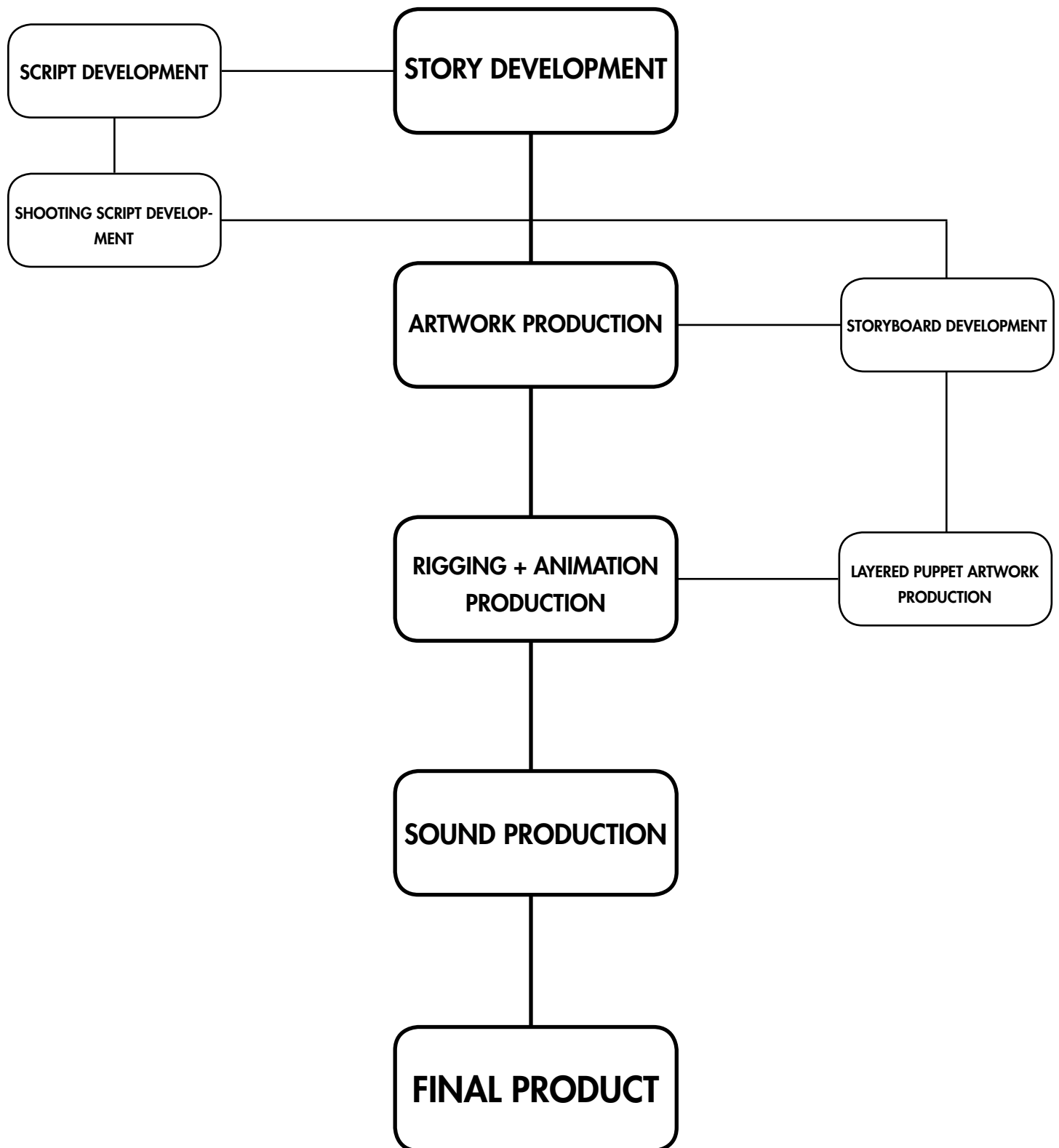
Georgenes, Chris. How To Cheat In Adobe Flash CS4: The Art of Design and Animation. UK: Elsevier Ltd., 2009.

- **Flash + AfterEffects: Add Broadcast Features To Your Flash Designs (2nd Edition)**

Jackson, Chris. Flash + AfterEffects: Add Broadcast Features To Your Flash Designs (2nd Edition). UK: Elsevier, 2010.

[FLOWCHART]

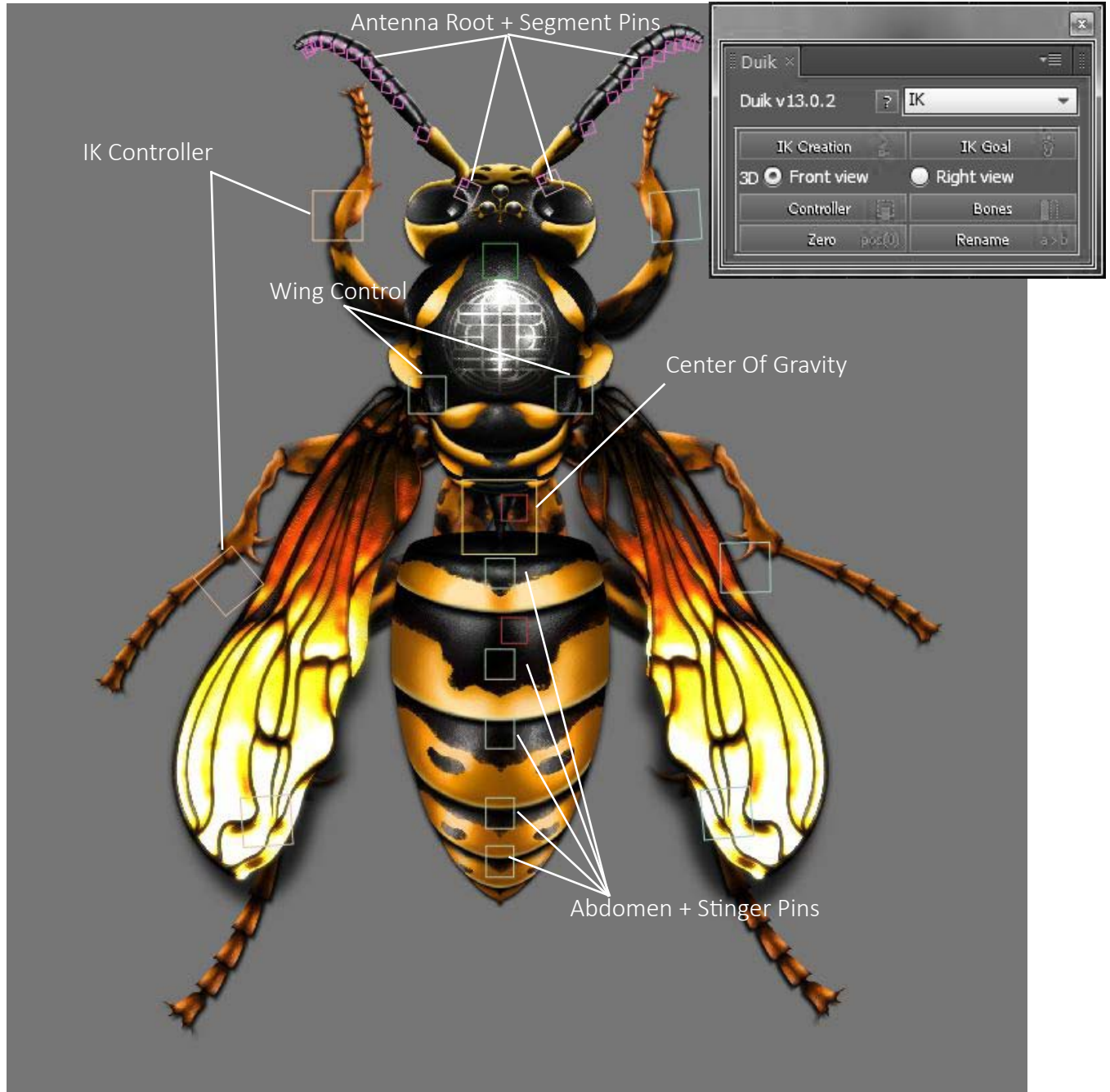
PLAN OF ACTION



[SCREENSHOTS]

CONTENT EXAMPLES

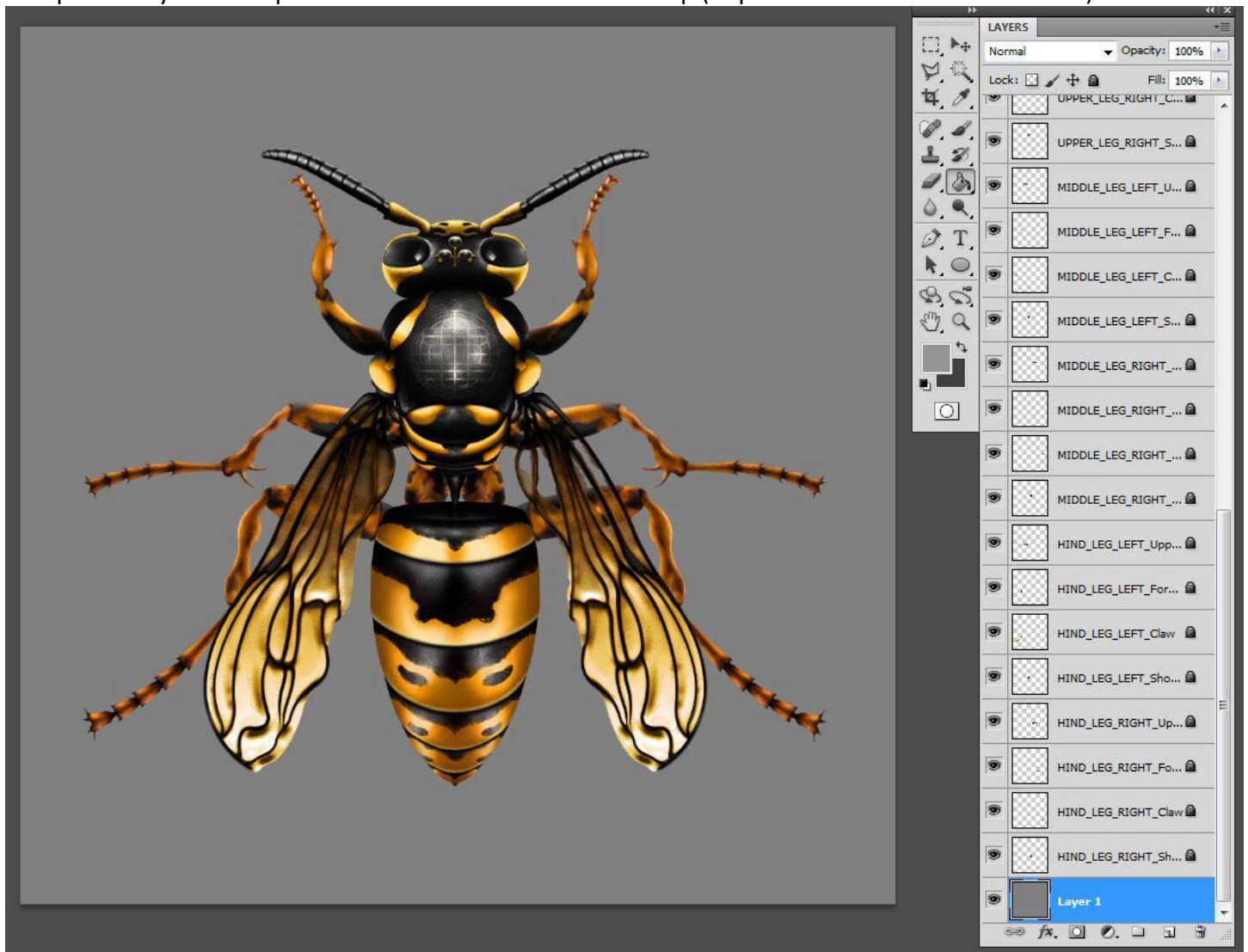
Fully Rigged Wasp Puppet Inside of Adobe After Effects + Duik Control Panel



[SCREENSHOTS]

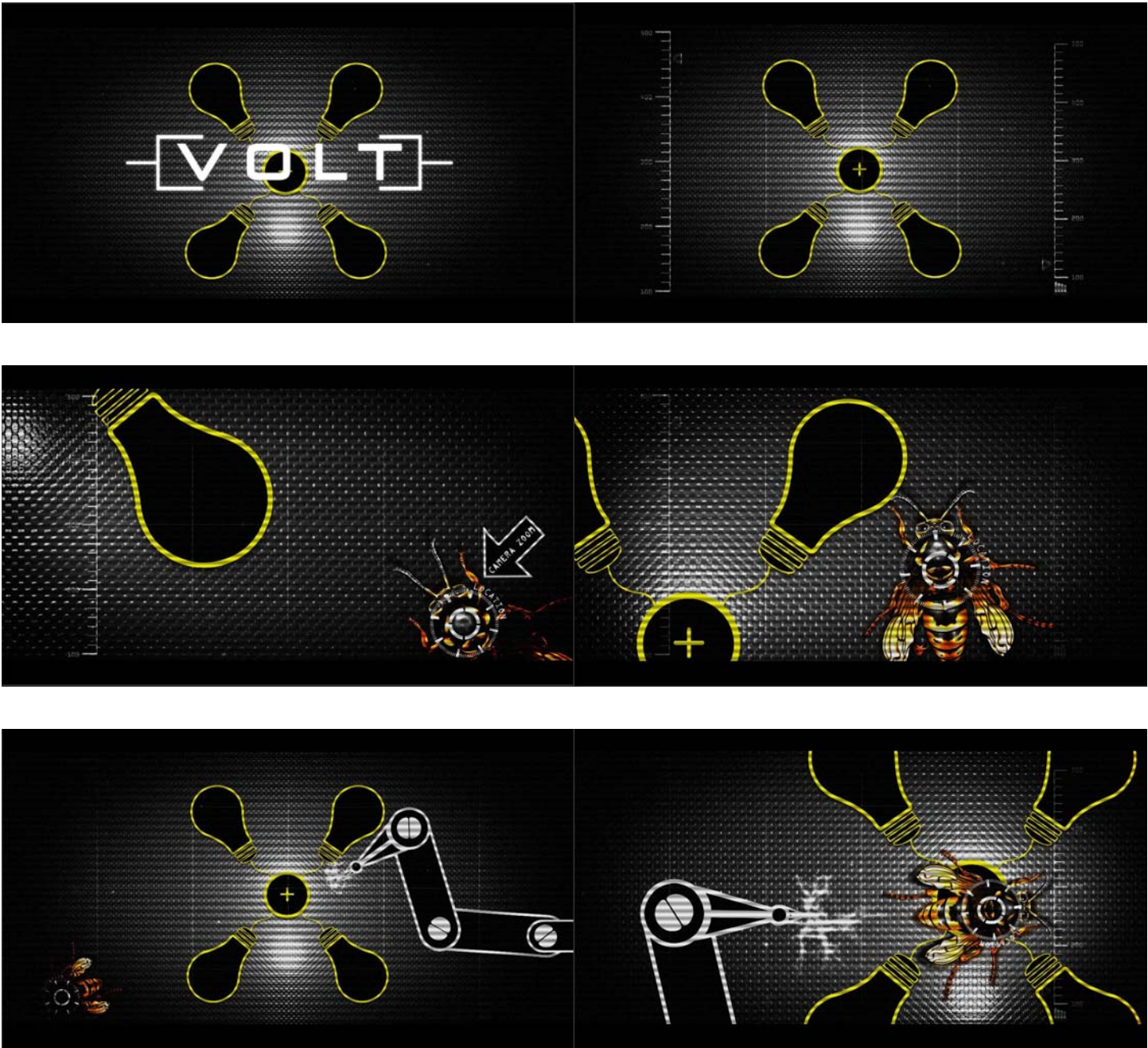
CONTENT EXAMPLES

Completed Layered Wasp Artwork Inside of Adobe Photoshop (Imported Into Adobe After Effects)



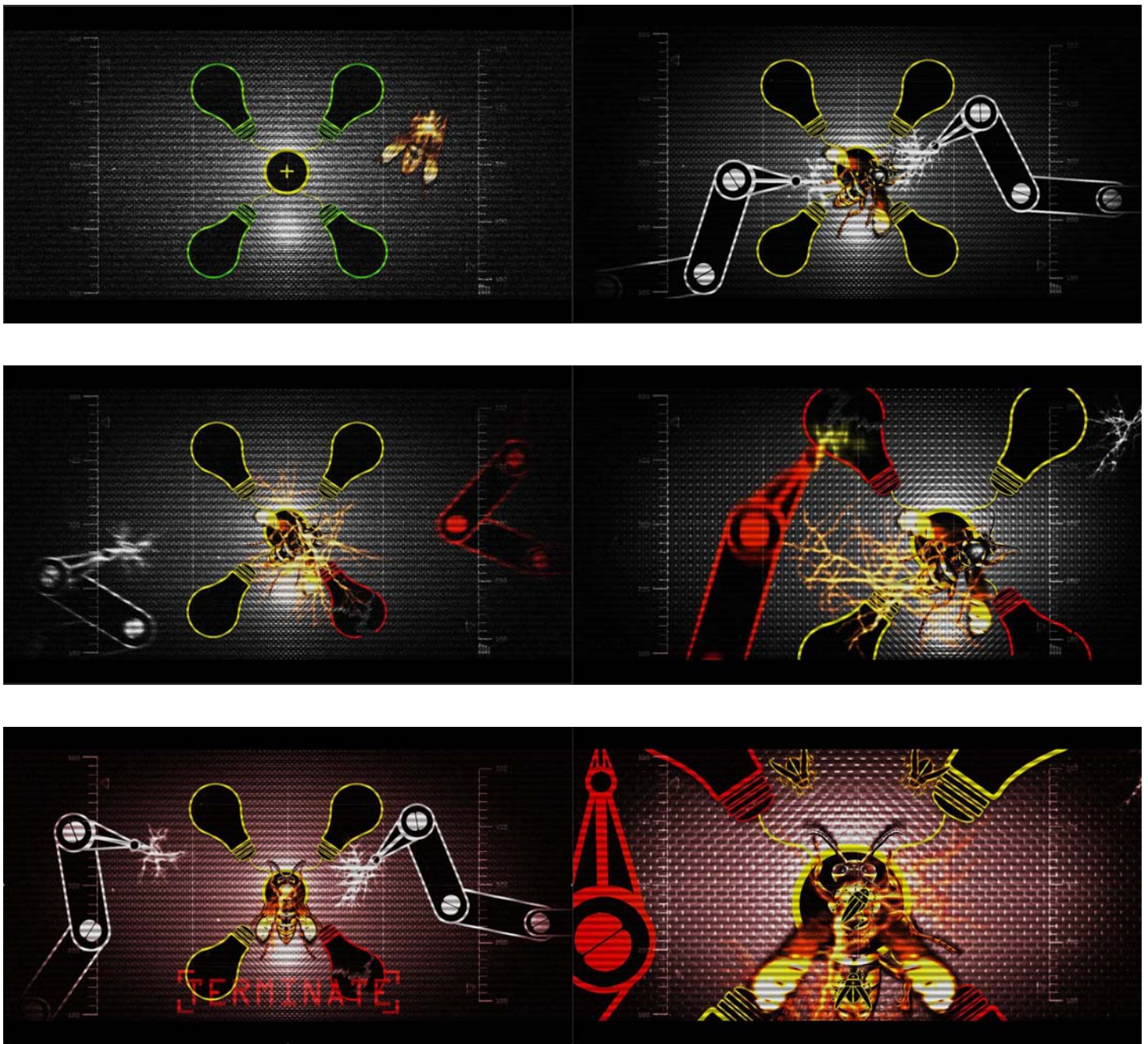
[STORYBOARDS]

PRODUCTION CONTENT EXAMPLES



[STORYBOARDS]

PRODUCTION CONTENT EXAMPLES



[STORYBOARDS]

PRODUCTION CONTENT EXAMPLES

